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Department of Energy

Richland Operations Office
P.O. Box 550
Richland, Washington 99352

91-EAB-084

APR 30 1991

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CORRESPONDENCE CONTROL

Mr. Timothy L. Nord
Hanford Project Manager
State of Washington
Department of Ecology
Mail Stop PV-11
Olympia, Washington 98504-8711

Dear Mr. Nord:

TRANSMITTAL OF INTERIM STATUS MANAGEMENT PLANS FOR THE LIQUID EFFLUENT RETENTION FACILITY

Transmitted herein are the five Draft Management Plans requested by the Washington Department of Ecology (Ecology) on the Liquid Effluent Retention Facility (LERF). Four of the five plans will also be included in the LERF Part B Permit Application is to be submitted on June 28, 1991. The inspection plan will not be included in the Part B.

The five plans included are:

1. Waste Analysis Plan - in the form of a draft of Chapter 3: Waste Characterization, of the forthcoming Part B Permit Application.

2. Preparedness/Prevention Plans - in the form of a draft of Chapter 6: Procedures to Prevent Hazards, of the forthcoming Part B Permit Application.

3. Contingency/Emergency Plan - in the form of Chapter 7: Contingency Plan, of the forthcoming Part B Permit Application.

4. Training Plan - in the form of a draft of Chapter 8: Personnel Training, of the forthcoming Part B Permit Application.

5. Inspection Plan - in the form of a rough draft of the "Tank Farms Plant Operating Procedure" (document number TO-670-030).

Transmittal of these plans closes an action item documented in the LERF Unit Managers' Meeting minutes.

91-EAB-084

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If you have any questions regarding these plans, please contact Mr. C. E. Clark of the U.S. Department of Energy, Richland Operations Office on (509) 376-9333, or Ms. C. J. Geier of Westinghouse Hanford Company on (509) 376-2237.

Sincerely,

E.A. Bracken

E. A. Bracken, Director
Environmental Restoration Division
Richland Operations Office

R E Lerch

R. E. Lerch, Manager
Environmental Division
Westinghouse Hanford Company

Enclosure:
Draft Management Plans

cc: P. T. Day, EPA, w/encl.
[redacted]
P. R. Stasch, Ecology, w/encl.

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3.0 WASTE CHARACTERISTICS [C]

This chapter provides information on the chemical, biological, and physical characteristics of the waste stored at the LERF. The waste consists of a dilute mixed waste stream--the 242-A Evaporator process condensate. The 242-A Evaporator treats liquid mixed waste stored in DSTs and generates the subject waste of this permit application. The waste is a process condensate consisting of the aqueous portion of the treated waste, along with most volatile substances and entrained nonvolatile substances removed from the waste feed. The volatile substances consist of organic compounds, ammonia, and radionuclides. The nonvolatile substances consist of organic compounds, inorganic salts, and radionuclides. The process condensate is stored at the LERF until subsequent treatment in the effluent treatment system. The *Double-Shell Tank System Dangerous Waste Permit Application* (DOE-RL 1991a) describes the operation of the DST System, and the *242-A Evaporator Dangerous Waste Permit Application* (DOE-RL 1991b) addresses the operation of the 242-A Evaporator. A third Part B permit application will be prepared to address the operation of the effluent treatment system.

The LERF stores process condensate from the 242-A Evaporator. A waste analysis plan is provided to characterize the process condensate. Discussion of waste characteristics refers to dangerous waste as defined by WAC 173-303.

Details provided in this chapter include the following:

- Chemical, biological, and physical analyses
- Waste analysis plan
- Additional requirements for wastes generated offsite
- Additional requirements for ignitable, reactive, or incompatible waste
- Land disposal restrictions.

3.1 CHEMICAL, BIOLOGICAL, AND PHYSICAL ANALYSES [C-1]

This section discusses the chemical, biological, and physical analyses of the process condensate. To provide an understanding of the waste characteristics of the process condensate, the different types of waste treated in the 242-A Evaporator are discussed. The operation and practices of the 242-A Evaporator also are discussed because the composition of the process condensate depends on the operating conditions of the 242-A Evaporator.

Specific treatment objectives are established before the start of each waste campaign. The objectives, including ones that determine the desired waste characteristics of the process condensate that are within the safe operating limits of the LERF liner system, are met through process control. Topics discussed include the following:

- 242-A Evaporator waste feed
- 242-A Evaporator operation and practices
- Process condensate historical waste analysis

- Waste designation of process condensate
- Containerized waste
- Waste in tank systems
- Waste in piles
- Landfilled wastes
- Waste incinerated and wastes used in performance tests
- Waste to be land treated.

3.1.1 The 242-A Evaporator Waste Feed

The 242-A Evaporator treats mixed waste generated during the production of special nuclear materials and research and development activities. The waste is stored as alkaline liquids and solids in underground DSTs located within the 200 East and 200 West Areas. The process condensate is generated from treatment of waste taken from these DSTs.

Waste stored in the DST System and treated by the 242-A Evaporator includes the following:

- PUREX nonaging waste or low-level waste

- Plutonium Finishing Plant low-level processing waste supernate

- B Plant process and miscellaneous waste including cell drainage and vessel cleanout waste

- S Plant laboratory and decontamination waste

- T Plant spent decontamination solutions

- 300 Area laboratory waste

- 300 Area fuels fabrication waste (no longer generated)

- 400 Area laboratory waste

- 100-N dilute phosphate decontamination waste and 100 Area spent fuel storage basin sulfate waste from ion exchange regeneration and sand filter backwashing (no longer generated)

- Single-shell tank (SST) salt well pumping waste.

Additional details on the waste streams and the bases for their designation as dangerous waste are presented in the DST System permit application.

3.1.2 The 242-A Evaporator Operation and Practices

This section provides an overview of the operation and practices of the 242-A Evaporator. A detailed discussion of operation is provided in the

242-A Evaporator permit application. The following information is included in this section:

- Process description
- Process condensate contributors
- Precampaign planning
- Process monitoring and product verification sampling
- Actions to be taken in the event of a process abnormality.

3.1.2.1 **Process Description.** The 242-A Evaporator uses evaporative concentration to reduce the volume of DST waste. The unit is a forced circulation, vacuum evaporation system. The major process components of the 242-A Evaporator are the vapor-liquid separator, the reboiler, the recirculation pump, the deentrainer pads, and the condenser system. Figure 3-1 shows the process flow diagram for the 242-A Evaporator.

The 242-A Evaporator is a distillation unit that separates feed materials into a stream or series of streams containing materials of differing volatility. The general steps involved in the operation of the unit are as follows.

- The temperature of the feed material is raised until the constituents to be recovered are vaporized.

- The vapor is condensed to recover the vaporized constituents.

The process condensate flows into the condensate collection tank (TK-C-100) and is pumped to the LERF for storage.

3.1.2.2 **Process Condensate Contributors.** The process condensate stream is a collection of the condensable materials carried over from the evaporation process into the condensers. These materials collect in tank Tk-C-100 as shown in Figure 3-2. A total of seven streams, three of which are from the condensers, discharge to the process condensate collection tank. The seven streams are:

- Primary condenser
- Intercondenser
- Aftercondenser
- Vessel vent seal pot
- Sample return line
- Decontamination solution
- Flex return line.

3.1.2.3 **Precampaign Planning.** At the start of each waste campaign, specific treatment objectives are set in the form of desired compositions of the slurry product and process condensate. One of the primary objectives is to ensure the compatibility of the process condensate with the LERF liner system. Four separate models--organic separation, vapor-liquid equilibrium, inorganic separation for nonvolatiles, and inorganic separation for ammonia--are used to calculate the expected composition of the waste stream. The models are based on well-known separation principles and historical performance records of the

242-A Evaporator. Application of the models to known waste feed composition and operating conditions helps determine whether the treatment specifications can be met before actual treatment. Details of all the specific treatment objectives and a discussion of the separation models are presented in the 242-A Evaporator permit application.

3.1.2.4 Process Monitoring and Product Verification Sampling. The characteristics of the process effluent are controlled by operating limits set at the 242-A Evaporator. The methods of controlling the 242-A Evaporator treatment process include precampaign sampling and analysis, establishing operating process control parameters, monitoring the process during the campaign run, and taking process effluent verification samples. Effluent streams from the 242-A Evaporator include slurry product, process condensate, vessel ventilation exhaust air, steam condensate, and used raw water. Each of these streams is monitored and sampled to ensure that the 242-A Evaporator treatment process is working as desired. The effluent streams and the monitoring and sampling associated with the streams are presented in Figure 3-3. The 242-A Evaporator process is monitored to quickly identify process abnormalities and to ensure that the required waste treatment is occurring. These monitoring procedures are summarized in the following sections and are discussed in greater detail in Chapter 4.0 of the 242-A Evaporator permit application.

3.1.2.4.1 Process Abnormality Monitoring. Process abnormality monitoring is performed primarily through monitoring of effluent streams. These effluent streams include the following:

- Process condensate
- Steam condensate
- Used raw water
- Vessel ventilation exhaust air.

Real-time monitoring consists of routing the effluent streams through in-line radiation monitors. Detection of excess radiation levels in any of the effluent streams serves as an early indicator of process abnormalities. Additionally, the vessel ventilation exhaust air is sampled for ammonia and organic emissions.

3.1.2.4.2 Waste Treatment Monitoring. Process parameters also are monitored to ensure adequate waste treatment is achieved (i.e., organics are separated from the inorganic waste constituents). The major equipment components that are monitored to ensure adequate waste treatment are the vapor-liquid separator, the condensers, and the vessel ventilation system. The parameters monitored in the vapor-liquid separator include the waste temperature, the waste feed rate, the slurry removal rate, the process condensate generation rate, and the vapor-liquid separator operating temperature.

3.1.2.5 Actions to be Taken in the Event of a Process Abnormality. The 242-A Evaporator is monitored continuously during operation to detect process abnormalities. Evidence that any of the process effluent streams are outside of expected limits results in stream diversion or process shutdown.

The effluent streams are monitored to confirm that organic removal is occurring in accordance with the precampaign process plan. Evidence that organics are not being separated from the slurry stream, that excessive quantities of inorganics or radionuclides are being carried over into the process condensate, or that steam condensate or raw water is becoming contaminated, results in these streams automatically being diverted to the feed tank (241-AW-102) and the process being shut down. Following process shutdown, the reasons for the process abnormality will be investigated and corrective actions or mitigative measures will be implemented before the treatment process is restarted.

3.1.3 Process Condensate Historical Waste Analysis

As identified in Section 3.1.1, different types of waste feed are treated in the 242-A Evaporator. Waste analysis data of the process condensate are available for four waste feed types treated. Sampling information including sample location, number of samples per location, date, and time are presented in Table 3-1; the analytical results for the four waste feed types treated are presented in Table 3-2. Table 3-3 presents the analytical procedures employed to test the samples. The analytical data represent 34 grab samples taken of the process condensate between August 1985 and March 1989 at four sampling locations. Ammonium ion, butyl alcohol, acetone, methyl ethyl ketone (2-butanone), and tetrahydrofuran were detected in more than 20 of the 34 samples. The mean, 90 percent confidence interval limit (upper limit of one-tailed 90 percent confidence interval), and maximum concentrations, as well as the standard deviation, are presented. For results below the detection limit, the replacement methods used for statistical analysis also are presented. The *242-A Evaporator Process Condensate Steam-Specific Report* (WHC 1990g) discusses the results in greater detail.

Raw water from the 200 East Area is used in the operation of the 242-A Evaporator and is a contributor to the process condensate waste stream. The pump seal water and deentrainment components basically are raw water (Section 3.1.2.2) and are integral to the proper operation of the 242-A Evaporator. Comparison of the analytical data for all 34 process condensate samples with respect to raw water samples is presented in Table 3-4. Evaluation of the data indicates 43 analytes (10 inorganic and 33 organic) were detected in the process condensate that were not detected in the raw water. Aluminum and total organic carbon were detected at one order of magnitude greater in the waste stream than in the raw water samples.

3.1.4 Waste Designation of Process Condensate

The process condensate has been designated a dangerous waste per WAC 173-303-070 with the following waste codes:

- F003 - Because of the presence of nonhalogenated spent solvents dimetyl ketone and methyl isobutyl ketone

- F005 - Because of the presence of the nonhalogenated spent solvent methyl ethyl ketone (2-butanone)

- WT02 - Because of the concentration of ammonia.

According to Ecology regulations, a waste is dangerous if it satisfies one or more of the following designation categories:

- Dangerous Waste Lists (WAC 173-303-080)
- Dangerous Waste Criteria (WAC 173-303-084)
- Dangerous Waste Characteristics (WAC 173-303-090).

The three designation requirements are discussed in the following paragraphs. The waste was designated through evaluation of both process information and sampling data. Processes were reviewed and compared with the discarded chemical products list and the dangerous waste source list. The process evaluation included a review of the following information sources:

- Material Safety Data Sheets
- Hanford Site Emergency and Hazardous Chemical Inventory Report
- Operating procedures
- Process chemical inventories
- Physical inspections, where possible.

Sampling data were used as screening tools to enhance and to support the results of the process evaluation. This screening compared the results of the sampling data with the waste lists contained in WAC 173-303-9903 and WAC 173-303-9904. If a constituent was cited on one or both of these lists, an engineering evaluation was performed to determine if the constituent had entered the waste stream as a discarded chemical product or as a dangerous waste source.

Screening organic constituents is a relatively simple procedure because organic compounds can be specifically identified through chemical analysis. However, inorganic compounds are not readily identified through chemical analysis, only the cation and anion components. A procedure was developed for combining anion and cation data to identify possible inorganic compounds. This screening procedure is described by Jungfleisch (1990) and is intended to be a tool in the evaluation of the process condensate according to the Ecology Dangerous Waste Lists criteria and characteristics. The listing of inorganic substances developed by this screening procedure is not intended to be a de facto indication that the substance was discharged to the waste stream, only that the specific cations and anions are present. The right physical conditions must exist for a certain inorganic compound to be present; this screening procedure cannot predict such conditions.

3.1.4.1 Dangerous Waste Lists. According to Ecology regulations, a listed waste is defined as a dangerous waste if it either (1) contains a discarded chemical product (WAC 173-303-081) or (2) originates from a dangerous waste source (WAC 173-303-082). An initial evaluation of chemical inventories and analytical results indicates that the process condensate does not contain discarded chemical products. However, the following five listed solvents from dangerous sources may be present in the process condensate:

- Acetone (F003)
- Butyl alcohol (F003)
- Methyl ethyl ketone (2-butanone) (F005)
- Methyl isobutyl ketone (F003)
- Pyridine (F005).

The process condensate contains listed waste sources. These sources are identified as spent nonhalogenated solvents (F003 and F005). The designation is discussed in greater detail in the following paragraphs. A further discussion of the process condensate designation is provided in the 242-A permit application Appendix 3B.

3.1.4.1.1 Acetone. Acetone was used in the laboratories to dry glassware and could have been disposed of, through drains, to the Tank Farms. Acetone was detected in all 34 samples of process condensate. The average concentration of acetone in these samples was 980 parts per billion. Acetone was detected in process condensate from 242-A Evaporator processing of ammonia scrubber feed, cladding removal waste, salt well feed, and during linked feed runs. Acetone in the form of a discarded chemical product has not been discharged to the Tank Farms. However, acetone as a spent solvent was determined to be present in the DSTs. Consequently, the process condensate is an F003 waste by applying the 'derived-from' rule [WAC 173-303-070(2)(a)].

3.1.4.1.2 Butyl Alcohol. Butyl alcohol is an impurity and degradation product from tributyl phosphate used in the PUREX Plant. It was detected in 30 of the 34 samples at an average concentration of 9,800 parts per billion (9.8 parts per million). Butyl alcohol was detected in process condensate from the processing of ammonia scrubber feed, cladding removal waste, salt well feed, and during linked feed runs. It is not known to be a discarded chemical product or a spent solvent.

3.1.4.1.3 Methyl Ethyl Ketone (2-butanone). Methyl ethyl ketone (2-butanone) was detected in 25 of the 34 samples at an average concentration of 51 parts per billion. It was detected in process condensate from the processing of ammonia scrubber feed, cladding removal waste, salt well feed, and during linked feed runs. Methyl ethyl ketone (2-butanone) was used in the reduction-oxidation (REDOX) process, and is determined to be a spent solvent discharged to the DSTs. Consequently, process condensate is an F005 waste by applying the 'derived-from' rule [WAC 173-303-070(2)(a)].

3.1.4.1.4 Methyl Isobutyl Ketone. Methyl isobutyl ketone (hexone) was detected in 10 of 34 samples at an average concentration of 11 parts per billion. Hexone was detected in process condensate from the processing of cladding removal waste and salt well feed, as well as during linked feed runs. Between 1951 and 1966, the REDOX Plant used a distillation process to clean hexone for reuse in the solvent extraction process. The hexone was first washed with sodium carbonate to remove the radiation-produced degradation products, and distilled to remove the water that had dissolved in it during washing. The water left behind was combined with the high-level waste stream for final steam stripping in the REDOX Plant waste concentrator. This step recovered any hexone dissolved in the high-level waste stream or in water from the distillation process. After steam stripping, the concentrated high-level waste was sent to boiling waste SSTs in the 241-S and 241-SX Tank Farms.

The high-level concentrate is considered a secondary waste from the hexone recovery process. The hexone recovery process was used to recover an F003 solvent. Hexone is not known to be a discarded chemical product. The content of the DSTs is a listed waste by applying the mixture rule [40 CFR 261.3(a)(2)(iii)]. Consequently, the process condensate is an F003 waste by applying the 'derived-from' rule [WAC 173-303-070(2)(a)].

3.1.4.1.5 Pyridine. Pyridine was detected in 1 of 34 samples at a concentration of 550 parts per billion. Pyridine was detected in process condensate from a linked feed run. Pyridine was not used in Hanford Site chemical processing. Therefore, it is neither a discarded chemical product or a spent solvent.

3.1.4.2 Dangerous Waste Criteria. According to the Ecology regulations, a waste is defined as a dangerous waste if the waste satisfies one or more of the following criteria categories:

- Toxic dangerous waste
- Persistent dangerous waste
- Carcinogenic dangerous waste.

A review of existing processes and analytical data indicated the process condensate is not a persistent or carcinogenic dangerous waste. However, it has been determined to be a toxic dangerous waste. Table 3-5 summarizes the calculations for the toxic dangerous designation of process condensate. Because halogenated hydrocarbons and polycyclic aromatic hydrocarbons were not detected, the process condensate is not a persistent dangerous waste. Table 3-6 summarizes the calculations for the carcinogenic compounds. The designation procedures used analyte concentrations that were calculated as the upper limit of the one-sided 90 percent confidence interval.

The toxic dangerous waste designation was determined by following the procedure set forth in WAC 173-303-084(5). The procedure calculates the equivalent concentration percentage of the waste stream. As defined in WAC 173-303-9906, a waste stream is a toxic dangerous waste if the calculated equivalent concentration percent sum of all applicable constituents is greater than 0.001 percent. Forty-seven substances associated with toxic categories were identified as potential constituents of the process condensate. These 47 substances contribute to the calculated equivalent concentration percent sum. Of these substances, ammonia is the largest contributor to the equivalent concentration percent sum. The calculated equivalent concentration percent sum of the process condensate varies between 0.000093 percent and 0.00108 percent. The high end of this range exceeds the designated limit of 0.001 percent, and therefore, the process condensate is a toxic dangerous waste (WT02).

The carcinogenic dangerous waste designation was determined by following the procedure set forth in WAC 173-303-084(7). Three substances potentially present in the process condensate were determined to be carcinogenic chemical compounds. These are cadmium chloride, nickel (II) hydroxide, and n-nitrosodimethylamine. Because none of the compounds exceeded 0.01 percent, and the sum was less than 1.0 percent of the waste quantity, the waste is not a carcinogenic dangerous waste.

3.1.4.3 Dangerous Waste Characteristics. Ecology regulations define a waste as dangerous waste if it is ignitable, corrosive, reactive, or toxic as measured by the toxicity characteristic leaching procedure (TCLP) (WAC 173-303-090). Evaluation of process and analytical data indicated the process condensate is not designated as a characteristic waste (Table 3-7). The rationale is discussed in the following sections.

3.1.4.3.1 Ignitability. The process condensate is a dilute aqueous waste. Although flash point testing was not performed, the waste is not expected to be ignitable. Dissolved nitrate is present in the waste but at very low levels. According to the description of ignitable properties in WAC 173-303-090, a waste is ignitable if defined as an oxidizer. The regulation 49 CFR 173.151 states the following:

> "An oxidizer for the purpose of this subchapter is a substance such as a chlorate, permanganate, inorganic peroxide, or a nitrate, that yields oxygen readily to stimulate the combustion of the organic matter."

Nitrate is an example oxidizer. However, nitrate is in the waste in such a dilute form (average of 2.8 parts per million), it is not expected to stimulate the combustion of organic matter. The requirement for nitrate to be present in a concentration and form to warrant the ignitable characteristic designation is supported in the Federal Register (52 FR 22520) that states the following:

> "In other words, the presence of any amount of the above substance does not indicate that a material is an oxidizer, rather one or more of these substances must be present in a quantity sufficient to yield oxygen and stimulate combustion."

The only chemical in an aqueous mixture similar to nitrate that has a concentration limit set for oxidizer classification is nitric acid. In the 49 CFR 173.101 "Hazardous Materials Table," nitric acid is given an oxidizer hazard class when the concentration exceeds 40 weight percent (i.e., 400,000 parts per million). Using this limit as a basis, the waste does not exhibit the characteristic of ignitability due to the presence of an oxidizer.

Furthermore, an ignitability index was calculated for the samples based on the sum of the percent concentrations of all ignitable contributors in the waste. Pure substances with a flash point less than 140 °F were considered ignitable. Using best professional judgment, samples with an ignitability index below 1 percent were not considered ignitable.

One or more chemical compounds potentially present in the process condensate are ignitable substances. The value of the index calculated from these constituents is between 0.000192 percent and 0.00786 percent, well below the 1 percent threshold level. Therefore, the process condensate is not an ignitable waste.

3.1.4.3.2 Corrosivity. Measurements of pH for the different waste types ranged from 9.72 to 10.83. For process condensate to be corrosive dangerous waste [WAC 173-303-090(6)], the pH must be less than 2 or greater than 12.5. Process condensate is, therefore, not a corrosive dangerous waste.

3.1.4.3.3 Reactivity. For process condensate to be a reactive dangerous waste [WAC 173-303-090(7)], it must: (1) readily undergo violent chemical change; (2) react violently or form potentially explosive mixtures with water; (3) generate toxic fumes when mixed with water or in the case of cyanide or sulfide bearing waste, when exposed to mild acidic conditions; (4) explode when subjected to a strong initiating force; (5) explode at normal temperatures and pressures; or (6) fit within the U.S. Department of Transportation forbidden explosives, Class A explosives or Class B explosives definitions. The process condensate is a dilute aqueous waste stream and clearly does not meet definitions (1), (2), (4), (5), or (6). Analysis was performed to determine the cyanide and sulfide concentrations, and whether the process condensate contains quantities of cyanide or sulfide to generate sufficient toxic gases to threaten human health or the environment. The unofficial threshold levels, as stated in SW-846 (EPA 1986a), for hydrogen cyanide gas and hydrogen sulfide gas are 250 milligrams per kilogram and 500 milligrams per kilogram, respectively. From the analytical results, cyanide was not detected in any of the samples. Only one sample showed a total sulfide concentration of 14 milligrams per kilogram, which is equivalent to 14.9 milligrams per kilogram of hydrogen sulfide. The process condensate is, therefore, not a reactive dangerous waste.

3.1.4.3.4 Toxicity. The process condensate is a toxic dangerous waste if contaminant results from TCLP testing exceed the limits set in WAC 173-303-090(8)(c). In the absence of specific TCLP test results, total analyte concentrations were used. Four analytes with concentrations above detection limits are on the TCLP toxic list and were found in the waste. The process condensate is not a toxic dangerous waste because none of the total analyte concentrations exceeded the TCLP toxic threshold levels. The levels in leachate derived from the TCLP are not expected to be greater than the total analyte concentrations.

3.1.5 Containerized Waste [C-1a]

Operation of the LERF does not involve the storage of dangerous waste in containers. Therefore, the requirements of this section are not applicable to the LERF.

3.1.6 Waste in Tank Systems [C-1b]

Operation of the LERF does not involve the storage of dangerous waste in tanks. Therefore, the requirements of this section are not applicable to the LERF.

3.1.7 Waste in Piles [C-1c]

Operation of the LERF does not involve the placement of dangerous waste in piles. Therefore, the requirements of this section are not applicable to the LERF.

3.1.8 Landfilled Wastes [C-1d]

Operation of the LERF does not involve the placement of dangerous waste in landfills. Therefore, the requirements of this section are not applicable to the LERF.

3.1.9 Waste Incinerated and Wastes Used in Performance Tests [C-1e]

Operation of the LERF does not involve the incineration of dangerous waste. Therefore, the requirements of this section are not applicable to the LERF.

3.1.10 Waste to be Land Treated [C-1f]

Operation of the LERF does not involve the land treatment of dangerous waste. Therefore, the requirements of this section are not applicable to the LERF.

3.2 WASTE ANALYSIS PLAN [C-2]

The primary objective of the waste analysis plan is to characterize the process condensate stored in the LERF to verify the process condensate is compatible with the liner system. The LERF does not store ignitable, reactive, or incompatible waste. Therefore, it is not necessary for this waste analysis plan to address waste-to-waste compatibility. Chapter 4.0, Section 4.4.5.1.1, discusses the liner compatibility test results and complete results are presented in Appendix 4C.

During precampaign planning at the 242-A Evaporator, the safe operating limits of the LERF liner system are considered in developing specific treatment objectives (specifications). The 242-A Evaporator is operated to ensure the process condensate complies with the treatment specifications. Composite samples of the process condensate are collected using a flow proportional sampler before discharge to the LERF. Results of the analyses are used to verify that process condensate complies, at the point of discharge, with the treatment specifications established during precampaign planning. Details of precampaign planning, treatment specifications, and the waste analysis plan for the process condensate are presented in the 242-A Evaporator permit application.

This section discusses the waste analysis approach for characterization of process condensate, and provides information on the following topics:

- Analytical parameters, methods of analysis, and rationale for selection
- Sampling program including operation of the sampler, sampling frequency, procedures for sample collection, required volumes, preservation techniques, and holding times
- Data analysis and reporting requirements
- Health and safety program for field personnel
- Quality assurance program including field and laboratory quality assurance and quality control procedures.

3.2.1 Analytical Parameters and Methods [C-2a, C-2b]

The analytical parameters are selected to accomplish the objective of waste analysis. These parameters, along with the approved methods of analysis and the rationale for selection, are presented in Table 3-8. The analytical methods are based on approved methods (per WAC 173-303-110) cited in the sources listed in Table 3-8. The specific analytical methods are referenced by the procedure number found in the associated testing method document.

The parameters were selected using the following criteria:

- Presence in the process condensate based on historical waste analysis, or potential presence in the process condensate based on process evaluation, and
- Potential adverse affects on the liner system as indicated in published literature and/or manufacturer specifications.

Beta activity, ammonium ion, and volatile organics such as acetone, carbon tetrachloride, methyl ethyl ketone (2-butanone), methyl isobutyl ketone (hexone), 2-propanol, and tetrahydrofuran could compromise the integrity of the liner system at concentrations that are much higher than expected in the process condensate. Based on compatibility testing results (Chapter 4.0, Section 4.4.5.1.1), the levels of these parameters in the process condensate do not compromise the liner system. However, the levels are tracked for the purpose of verification.

3.2.2 Sampling Program [C-2c, C-2d]

Collection of samples representative of the variability of the waste in the LERF is required for proper waste characterization. Sample risers located in each LERF basin (Drawing H-2-79591 in Appendix 4B) are used to collect samples. The rationale for the sampling program, sampling frequency, description of the sample risers, the operation of the sampler, procedures for sample collection, required volumes, preservation techniques, and holding times are presented in the following paragraphs.

The sampling program accounts for the potential variability of waste composition in the LERF. Although the waste is a dilute aqueous waste stream, process condensate from different feed types is commingled. Process condensate is discharged into each basin via a single pipe per basin, and mixing occurs primarily from the action of discharge. The possibility of solids precipitation could exist. Organic phase separation, although unlikely, could occur. Spatial and depth variations within each basin could develop. The sampling program is designed to ascertain any spatial and depth variations at the outset. Subsequent routine rounds of sampling are designed according to results from the initial round of sampling.

Ideally, to achieve a representative characterization of the process condensate, multiple samples should be collected from randomly chosen locations and depths. However, fixed sampling locations had to be chosen for the LERF because random sampling is infeasible. The SW-846 methods (EPA 1986a) do not offer specific guidance on the initial sampling strategy for waste streams without historical in-basin data, as is the case with process condensate stored in the LERF. To determine the number of samples to adequately characterize basin contents, a statistical method of analysis known as hierarchical or nested analysis of variance (ANOVA) was employed. The analysis indicated a total of nine random locations throughout each basin and five depths at each location are necessary for initial characterization. Operational constraints and characteristics of the waste were considered to further refine the sampling program.

The LERF is a covered waste management unit. It is impractical to lift the covers of the basins for sample collection. From a health and safety standpoint, the increased risks to field personnel from the removal of the covers are not justified. Therefore, the use of random sample locations is infeasible. Instead, sample risers with fixed locations are used. Drawing H-2-79592 in Appendix 4B provides a schematic of a typical sample riser. The sample risers are constructed of 6-inch (152 millimeter) pipe extending the entire depth of each basin. The pipe is similar to a gas collection pipe and is slotted from the maximum water level at the top to the bottom of each basin. The pipes are laid on the sides of each basin and supported by two 3-inch (76 millimeter) HDPE pipe filled with concrete grout, one on each side. The slotted pipe allows for representative sample collection at different depths in each basin. Eight sample risers are provided in each basin, spaced along the sides. In addition, a ninth sampling location is provided through an access hatch in each basin cover at the center of the basins. Locations of these sampling points are shown in Drawing H-2-79591 in Appendix 4B.

According to the hierarchical analysis of variance method, five random depths at each sample location are necessary to characterize the potential vertical variability of the LERF process condensate. However, existing knowledge of process condensate constituents and their propensity to partition into a density gradient, producing stratification of basin contents, can be used to reduce the number of samples required to characterize the vertical profile of the stored waste. Based on the solubility products of the constituents of process condensate, it was determined that stratification is unlikely. If stratification were to occur, only three layers would be present. The top of the fluid column would consist of organics that are less dense than water, the middle layer would consist of a mixture of the process condensate, and the bottom would consist of precipitation solids and/or denser organics. Thus, samples taken from three depths instead of five at each sample port are sufficient to provide in-basin characterization of the waste.

In the first round of sampling, grab samples are collected from the eight sample risers at three specified depths. The exact number of locations and depths to be sampled in subsequent routine rounds of sampling depends on analysis of the first round of results. The number of locations may be reduced if the process condensate in the LERF is determined to be homogeneous, and the number of depths could be reduced if stratification does not occur. Sampling at the basin centers could be included in subsequent sampling rounds if initial results demonstrate statistically significant aereal variation in the waste. The sampling program at the LERF is summarized in Table 3-9.

The sampling program is repeated on the following basis:

- Basins actively receiving process condensate--at one-half capacity [i.e., 3.25 million gallons (12.3 million liters)] and full capacity [i.e., 6.5 million gallons (24.6 million liters)], or every 6 months, whichever comes first. The capacity is based on flow totalizer readings taken at a flow-proportional composite sampler located in the 242-A Evaporator

- Basins that are full--every 6 months.

The sampling frequency is based on several considerations. Proper operation of the 242-A Evaporator is complex, and the feeds are processed on a batch basis, or by waste campaign. Therefore, the waste generation rate for any given period of time is not expected to be the same. From historic records between 1985 and 1988, the 242-A Evaporator generated annually between 8.8 million gallons (33.3 million liters) and 12.4 million gallons (46.9 million liters) of process condensate (WHC 1990g). Although the generation rate is expected to be less than historic generation rates, the exact generation rate is varied depending on operating conditions of the 242-A Evaporator and mission objectives. Each basin has a capacity of 6.5 million gallons (24.6 million liters), and each basin is expected to fill up between 6 and 18 months. For basins actively receiving process condensate, sampling frequency based on both capacity and time is required. As discussed previously, if stratification does occur, it would develop over time, such as over a 6-month period. If the generation rate is greater than expected, it would be appropriate to obtain samples from each basin at half and full capacities. For basins already filled with process condensate, sampling frequency based on time only is required.

A portable sampler equipped with a peristaltic pump is used to sample the waste. It has a maximum lift capacity of 26 feet (8 meters), which is adequate to withdraw samples from the bottom of each basin. Teflon* tubing is lowered to the bottom of the sample riser to collect the first sample. The tubing is raised to the appropriate heights for the next two samples collected from the middle and the top of the water column. The tubing is flushed with source liquid at the specified depth before the collection of each sample. Each sample is taken by filling a glass bottle with approximately 1.7 liters of process condensate and immediately transferring the sample to the appropriate bottles. Required volumes, preservation techniques, and holding times of the different parameters are detailed in Table 3-10. Chain-of-custody procedures are followed.

3.2.3 Data Analysis and Reporting

The mean and upper limit of one-tailed 80 percent confidence interval concentrations for each parameter in each basin are calculated. The total mass of each parameter in each basin also is calculated for the two concentrations.

A complete report is prepared for each semiannual sampling event of the waste in the LERF. The report includes the following information:

- Minimum, maximum, mean, and upper limit of one-tailed 80 percent confidence interval concentrations for all the samples
- Height and total volume of waste in each basin, and unusual field conditions and occurrences
- Rationale for reducing the number of sample locations and sample depths if relevant.

3.2.4 Quality Assurance Program

In accordance with the Tri-Party Agreement (Ecology et al. 1989), quality assurance and quality control procedures are implemented and followed during field and laboratory activities (i.e., sample collection, transportation, storage, and analysis). The purpose of the quality assurance and quality control procedures is to ensure that the analytical data derived from the LERF waste sampling effort are of a known and acceptable level of quality (i.e., precision, accuracy, completeness, and representativeness). The quality assurance and quality control procedural requirements vary depending on the

* Teflon is a trademark of E.I. DuPont de Nemours & Company.

specific field and analytical methods used. The following outlines the basic quality assurance program employed for LERF waste characterization activities.

The data quality objectives defined for the project quality assurance program include quantitative objectives (i.e., accuracy, precision, and completeness) and qualitative objectives (i.e., comparability and representativeness). Conformance with these requirements throughout field and laboratory activities is imperative to optimize the quality of data. The general objective is to ensure the analytical data fall within project required control limits. Project data quality objectives are described as follows.

- Accuracy--Accuracy is defined as the degree of difference between calculated values and the true values. The closer the numerical value of the measurement comes to the true value, the more accurate the measurement. Sample accuracy is determined in the laboratory through the use of matrix spike and matrix spike duplicate analysis. Analytical accuracy is determined by evaluating results of instrument calibration, tuning, and internal standards.

- Precision--Precision is defined as the reproducibility among replicate measurements of the same sample. Analytical precision is determined through the use of laboratory duplicate analysis (e.g., matrix spike and matrix spike duplicate analyses). Total measurement precision is measured by the analysis of field replicate samples. The relative percent difference is calculated from the duplicate and/or replicate analysis and used as an indication of the precision of the analysis performed.

- Completeness--Completeness is defined as the percentage of valid data obtained as compared to the amount that was expected to be obtained under normal conditions. For data to be considered valid, data must meet all of the acceptance criteria specified by the analytical method used (including accuracy and precision criteria). Invalid data (data outside the established acceptance criteria) include, but are not limited to, accuracy and precision values outside project control limits, number of contaminants detected in blank samples, analyses conducted beyond method-recommended holding times, and incomplete sample activity documentation.

- Comparability--Comparability is defined as the confidence with which one data set can be compared to another. To ensure comparability of data, the use of consistent sampling and analysis procedures are employed. In addition, the procedures used are approved EPA methods whenever possible.

- Representativeness--Representativeness is defined as the degree to which the data accurately and precisely represent a characteristic of the population being measured. This parameter is evaluated by calculating the relative percent differences between field replicate samples, the quantity and concentrations of all interferents detected in supporting field and laboratory quality control blanks, and the overall accuracy and precision of quality control samples.

3.2.4.1 Field Quality Assurance and Quality Control. Sampling procedures (i.e., standard operating procedures) are developed to collect representative data and to verify integrity of the samples collected. These procedures include: (1) decontamination procedures; (2) replicate sample collection; (3) sample labeling, handling, and shipping; and (4) field quality control checks.

3.2.4.1.1 Decontamination Procedures. Decontamination procedures prevent contamination of samples by materials originating from onsite activities. All sampling equipment are decontaminated before sampling activities begin and in between each sampling location, which includes in between sampling intervals.

3.2.4.1.2 Replicate Sample Collection. Replicate samples are collected as a means of assessing the reproducibility of the sampling effort. As a general rule, one replicate is taken for every 10 sampling points. Replicate samples are coded to prevent recognition of the quality control samples by laboratory personnel.

3.2.4.1.3 Sample Labeling, Handling, and Shipping. All sample containers are selected to ensure compatibility with the waste stream and are properly prepared (if required) in accordance with established methodologies to be used. Sample labels and sample tags are filled out at the time of sampling and are affixed securely to each container. The labels and tags identify the sample number, collector's signature, date and time of collection, location of sampling point, and preservatives added. Chain-of-custody procedures are implemented to track and document sample collection, shipment, and laboratory processing.

3.2.4.1.4 Field and Trip Blanks. In addition to the replicate field sampling, collection and analysis of field blanks and trip blanks also are performed. Field blanks are used to assess the efficiency of equipment decontamination procedures in preventing cross-contamination between samples.

Trip blanks are used to assess cross-contamination of sample containers during storage at the site and contamination of samples during transport back to the laboratory. In general, the frequency for field blanks is one per parameter for every 20 samples (or group of samples), and the frequency for trip blanks is one per parameter per sampling event.

3.2.4.2 Laboratory Quality Assurance and Quality Control. The main objective of laboratory quality assurance and quality control procedures is to ensure the precision, accuracy, and completeness of the analytical data. These parameters are discussed in Section 3.2.5.1. In addition, all quality control data are documented formally and include, when applicable, instrument timing and calibration, surrogate spike analysis, duplicate sample analysis, matrix spike and matrix spike duplicate analysis, and analysis of calibration standards, internal standards, and method blanks. The frequency for quality control samples is generally 5 percent (1 for every 20 field samples or group of samples, whichever is less), unless otherwise noted in the established methods being followed.

3.3 ADDITIONAL REQUIREMENTS FOR WASTES GENERATED OFFSITE [C-2e]

The LERF does not store or treat dangerous waste generated offsite. Therefore, the requirements of this section are not applicable to the LERF.

3.4 ADDITIONAL REQUIREMENTS FOR IGNITABLE, REACTIVE OR INCOMPATIBLE WASTE [C-2f]

Ignitable, reactive, and incompatible waste is not being stored in the LERF. Section 3.1.4.3 discusses the dangerous characteristics of the process condensate. Therefore, the requirements of this section are not applicable to the LERF.

3.5 LAND DISPOSAL RESTRICTIONS

Process condensate from the 242-A Evaporator is a mixed waste subject to land disposal restrictions because of the presence of listed spent solvents: acetone (F003), methyl ethyl ketone (2-butanone) (F005), and MIBK or hexone (F003). According to 40 CFR Part 268.42(d), 268.35(d), and 268.12(c), mixed waste, for which hazardous components are spent solvents, dioxins, or California list wastes, must meet treatment standards. Although the Tri-Party Agreement grants the U.S. Department of Energy a variance from this schedule in the land disposal restriction requirements, the appropriate constituents subject to the requirements are nevertheless tracked. The sampling program described in Section 3.2.2 accomplishes this task. The provisions of the Tri-Party Agreement are presented in the following paragraphs.

Storage of dangerous mixed waste in the LERF is addressed in the Land Disposal Restriction Provisions of the Tri-Party Agreement. The Tri-Party Agreement states that process condensate from the 242-A Evaporator may be discharged to the LERF from December 1990 through December 1994 if the following conditions are met:

(1) Placement of process condensate into the LERF is necessary for completion of milestones required by the Tri-Party Agreement

(2) Interim status authorization includes the LERF or that a RCRA permit for the LERF has been issued

(3) The LERF meets the requirements of 40 CFR Part 264, Subpart K, or 40 CFR Part 265, Subpart K

(4) The LERF maintains a floating cover that minimizes evaporation

(5) The LERF complies with all applicable dangerous waste requirements

(6) Prior certification of compliance with 40 CFR 268.4(a)(3) is submitted in accordance with 40 CFR 268.4(a)(4)

(7) There is no discharge of land disposal restricted waste to the LERF other than process condensate from the 242-A Evaporator.

The following is an explanation of the means by which these conditions are satisfied.

(1) One of the major milestones in the Tri-Party Agreement is the completion of a liquid effluent treatment system for effluent streams formerly discharged to cribs, ponds, or ditches (Ecology et al., p. 2-11; M-17-00). Waste from the 242-A Evaporator is included in this group of waste streams and will be treated when the effluent treatment system goes online. Startup of the 242-A Evaporator before this date is necessary to meet other deadlines specified in the Tri-Party Agreement regarding reduction of waste volumes in the DSTs. The LERF is necessary to provide storage capacity in the interim period between startup of the 242-A Evaporator and startup of the effluent treatment system.

(2) The LERF has been constructed under an expansion of interim status.

(3) The 40 CFR Part 265, Subpart K, contains the standards for surface impoundments at interim status treatment, storage, and/or disposal facilities. These standards include requirements for the following:

- Two or more liners and a leachate collection system (demonstrated in Chapter 4.0, Section 4.4.3.1)

- Maintenance of sufficient freeboard to prevent overtopping [minimum 2 feet (.61 meter)] [LERF maintains 5 feet (1.5 meters) of freeboard as demonstrated in Chapter 4.0, Section 4.4.8]

- Protective cover (grass, shale, or rock) on earthen dikes to minimize erosion and preserve structural integrity (demonstrated in Chapter 4.0, Section 4.4.9.11)

- Waste analysis and trial tests for surface impoundments where waste is treated (not applicable to the LERF, which is a storage unit)

- Daily inspections of freeboard level and weekly inspections of dikes and surrounding vegetation (demonstrated in Chapter 6.0, Sections 6.2.2.4 and 6.2.2.4.1.1)

- Removal or decontamination of all waste residues and contaminated liner components at closure, and compliance with 40 CFR 265, Subpart G and 40 CFR 265.310 for closure and postclosure care (demonstrated in Chapter 11.0)

- Special management of ignitable or reactive waste (not applicable to the LERF)

- Special requirements for incompatible waste (not applicable to the LERF).

(4) Each of the basins has a floating cover made of VLDPE. The covers are tensioned and anchored to prevent wind damage and to minimize exposure of basin contents to the atmosphere. (Chapter 4.0, Section 4.4.3.5.)

(5) The LERF complies with all applicable dangerous waste requirements for surface impoundments, as detailed in this permit application.

(6) The 40 CFR 268.4 applies to treatment surface impoundments. The LERF is a storage unit and no treatment is conducted. Therefore, written certification of the adequacy of the surface impoundment to treat restricted waste is not relevant to this permit application.

(7) The LERF receives regulated waste from one source only: process condensate from the 242-A Evaporator (a mixed waste subject to land disposal restriction considerations). No other waste is stored in the LERF.

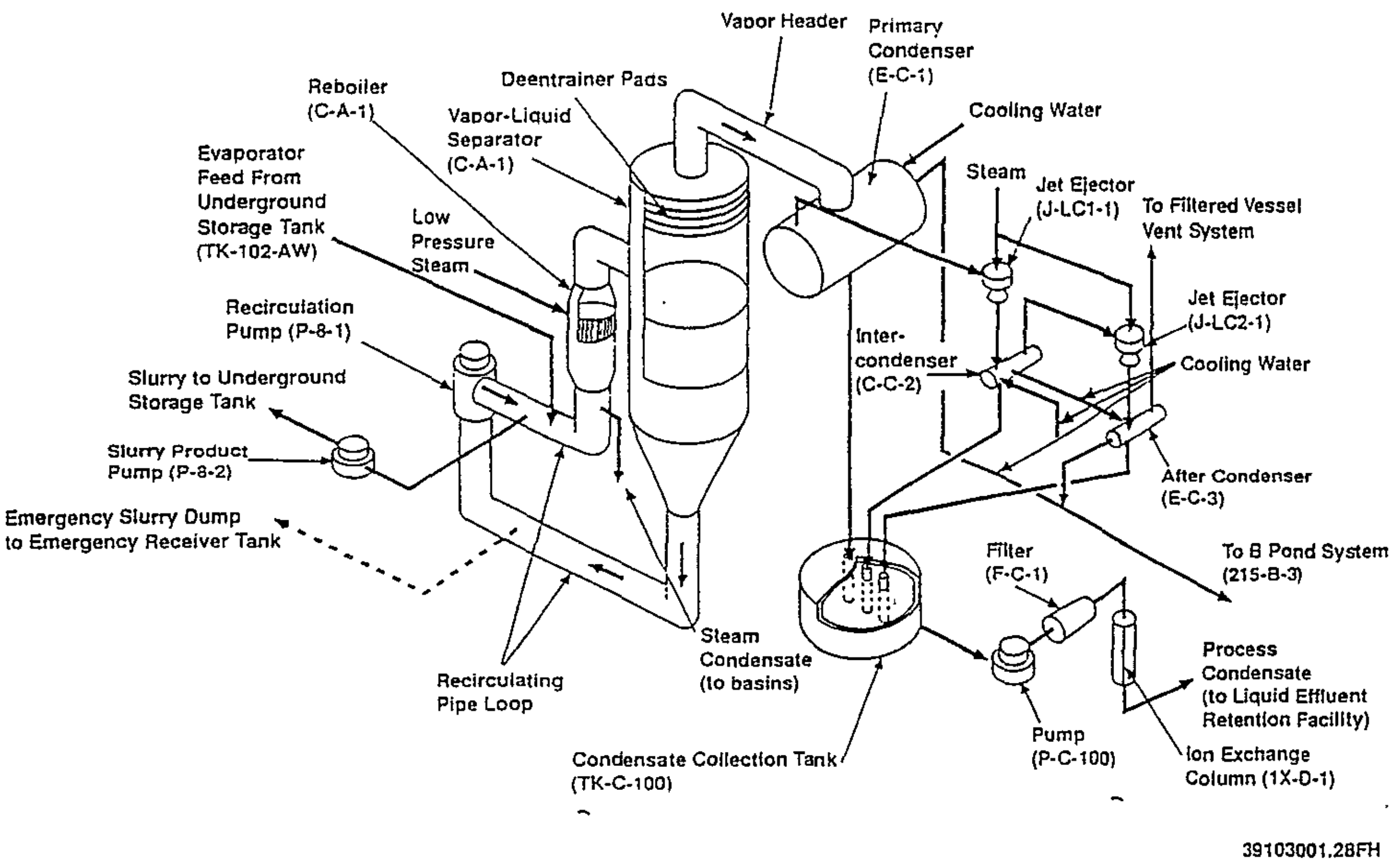

Figure 3-1. The 242-A Evaporator Process Flow Diagram.

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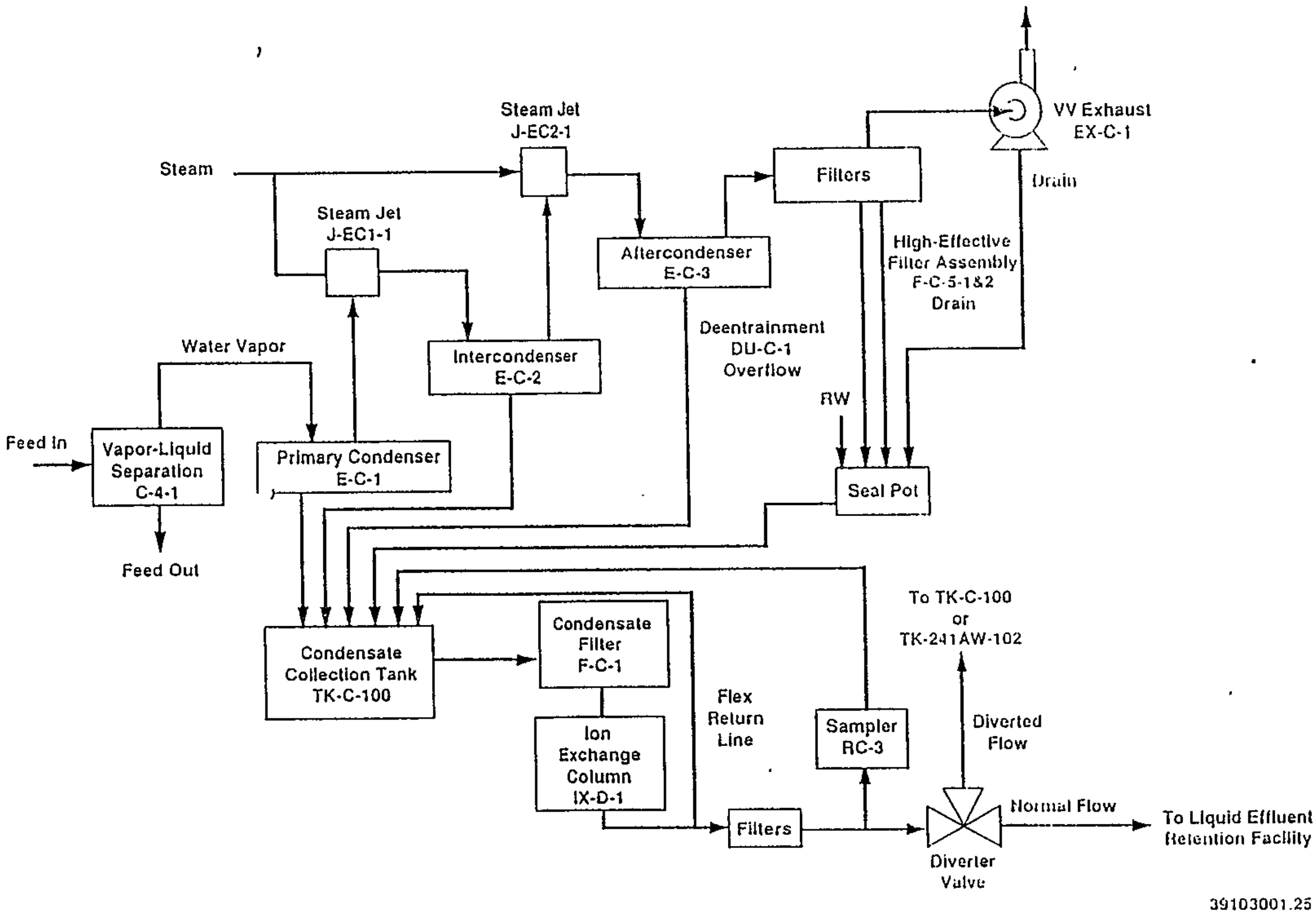

Figure 3-2. Schematic of 242-A Evaporator Process Condensate.

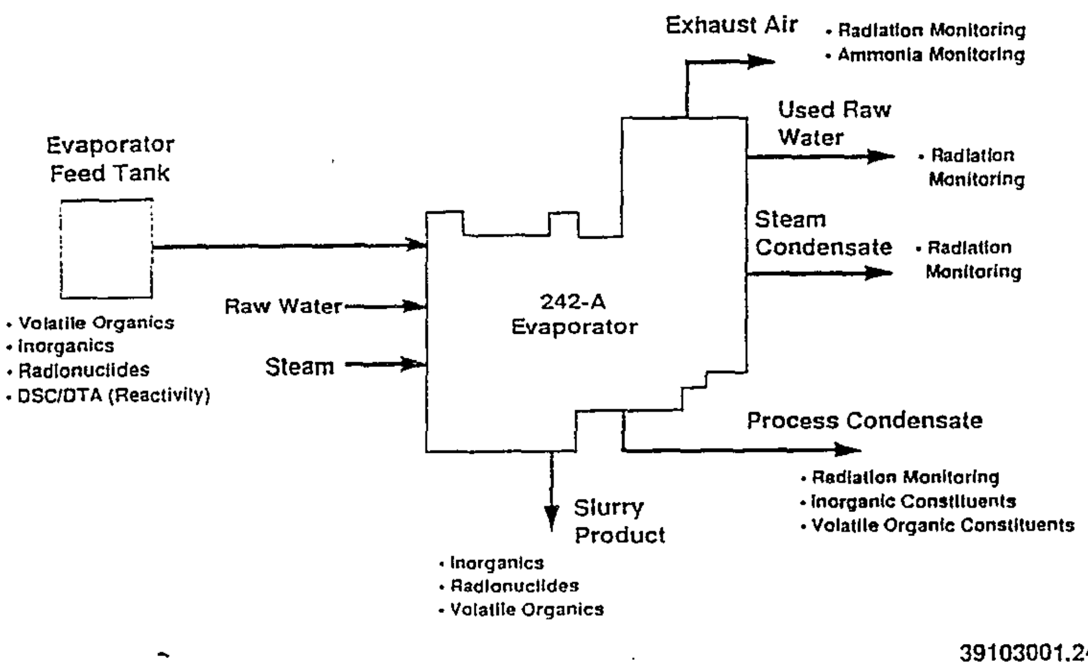

Figure 3-3. Sampling and Monitoring Program for the 242-A Evaporator Feed and Effluent.

Table 3-1. The 242-A Evaporator Process Condensate Sample Locations and Dates.

Feed type	Sample location	Number of samples	Date	Time
Cladding removal waste	R-C-3 sampler	2	03/17/88	09:52
			03/03/88	15:41
	Basin 1	1	03/03/88	13:35
	Basin 2	1	03/04/88	09:27
	Basin 3	1	03/05/88	09:04
Linked feed	R-C-3 sampler	7	08/25/85	18:19
			06/13/86	13:33
			07/03/86	10:09
			10/13/86	10:28
			03/12/87	13:56
			09/02/87	09:55
			02/26/88	12:03
	Basin 1	1	02/25/88	09:26
	Basin 2	2	09/19/88	09:38
			02/27/88	09:30
	Basin 3	2	02/19/88	09:08
			02/26/88	10:34
Ammonium scrubber feed	R-C-3 sampler	5	10/11/88	09:58
			10/27/88	08:05
			02/28/89	10:32
			03/09/89	10:12
			03/22/89	10:32
	Basin 1	4	03/22/89	11:24
			01/28/88	09:23
			03/10/88	14:53
			08/12/88	10:21
	Basin 2	2	03/10/88	14:53
			08/08/88	10:00
	Basin 3	2	03/10/88	14:53
			08/13/88	09:50
Salt well	Basin 1	1	07/10/88	09:14
	Basin 2	2	07/08/88	09:35
			07/13/88	16:02
	Basin 3	1	07/09/88	09:06

Reference: WHC 1990g.

Table 3-2. Historical Waste Analysis Results of 242-A Evaporator Process Condensate. (sheet 1 of 4)

				Concentration[a] (ppb)			
Parameter	N[b]	MDA[c]	Method[d]	Mean	StdErr[e]	90%CILim[f]	Maximum
Cladding Removal Waste Feed							
Aluminum	5	0	NA[g]	1.14 E+03	9.66 E+01	1.29 E+03	1.47 E+03
Barium	5	4	DL	6.00 E+00	2.13 E-07	6.00 E+00	6.00 E+00
Calcium	5	0	NA	4.97 E+03	1.15 E+03	6.74 E+03	7.88 E+03
Chloride	5	3	DL	6.23 E+02	8.51 E+01	7.54 E+02	9.32 E+02
Magnesium	5	4	DL	5.42 E+01	4.20 E+00	6.06 E+01	7.10 E+01
Mercury	5	0	NA	5.26 E-01	5.87 E-02	6.16 E-01	6.90 E-01
Potassium	5	0	NA	6.03 E+02	3.20 E-01	6.52 E+02	6.74 E+02
Uranium	5	0	NA	3.88 E-01	2.42 E-01	7.59 E-01	1.35 E+00
Zinc	5	4	DL	5.00 E+00	1.51 E-07	5.00 E+00	5.00 E+00
Acetone	5	0	NA	2.10 E+03	2.89 E+02	2.54 E+03	2.57 E+03
Ammonia	5	0	NA	6.41 E+05	1.12 E+05	8.12 E+05	1.00 E+06
Benzyl alcohol	3	0	NA	1.47 E+01	1.76 E+00	1.80 E+01	1.80 E+01
Butanal	4	0	NA	4.42 E+01	1.31 E-01	6.57 E+01	7.60 E+01
1-Butanol (butyl alcohol)	5	0	NA	4.60 E+04	1.90 E+04	7.51 E+04	8.80 E+04
2-Butoxyethanol	5	0	NA	5.52 E+02	1.09 E+02	7.20 E+02	8.40 E+02
Butoxyglycol	5	0	NA	2.77 E+02	6.95 E+01	3.84 E+02	5.40 E+02
3,5-Dimethylpyridine	3	0	NA	2.07 E+01	2.03 E+00	2.45 E+01	2.40 E+01
2-Hexanone (methyl n-butyl ketone)	4	0	NA	9.25 E+00	1.11 E+00	1.11 E+01	1.10 E+01
Methyl ethyl ketone (2-Butanone)	5	0	NA	7.16 E+01	1.04 E+01	8.76 E+01	9.00 E+01
MIBK (hexone)	3	0	NA	4.33 E+00	3.33 E-01	4.96 E+00	5.00 E+00
2-Pentanone (methyl n-propyl ketone)	4	0	NA	8.75 E+00	1.25 E+00	1.08 E+01	1.20 E+01
2-Propanol	1	0	NA	3.90 E+01	NA	NA	3.90 E+01
Tetradecane	4	0	NA	1.92 E+01	3.61 E+00	2.52 E+01	2.60 E+01
Tetrahydrofuran	5	0	NA	1.50 E+01	1.48 E+00	1.73 E+01	1.80 E+01
Tributylphosphate	5	0	NA	3.59 E+03	1.28 E+03	5.55 E+03	6.80 E+03
Tridecane	4	0	NA	1.27 E+01	2.06 E+00	1.61 E+01	1.80 E+01
Unknown	3	0	NA	4.40 E+01	1.30 E+01	6.85 E+01	6.60 E+01
Alpha activity (pCi/L)	2	0	NA	2.15 E-01	6.30 E-02	4.09 E-01	2.78 E-01
Beta activity (pCi/L)	5	0	NA	3.86 E+02	1.88 E+02	6.73 E+02	1.09 E+03
Conductivity (µS)	5	0	NA	3.18 E+02	3.73 E+01	3.75 E+02	4.20 E+02
pH (dimensionless)	5	0	NA	1.05 E+01	5.10 E-02	1.06 E+01	1.07 E+01
Temperature (°C)	2	0	NA	3.33 E+01	3.40 E+00	4.38 E+01	3.67 E+01
TOC	5	0	NA	4.38 E+04	8.91 E+03	5.75 E+04	6.25 E+04
Linking Run Feed							
Aluminum	12	1	LM	5.99 E+02	1.22 E+02	7.65 E+02	1.65 E+03
Barium	12	11	DL	6.00 E+00	1.17 E-07	6.00 E+00	6.00 E+00
Cadmium	12	11	DL	2.25 E+00	2.50 E-01	2.59 E+00	5.00 E+00
Calcium	12	0	NA	2.04 E+03	3.45 E+02	2.51 E+03	4.37 E+03
Chloride	12	10	DL	5.94 E+02	6.50 E+01	6.83 E+02	1.17 E+03
Copper	12	8	LM	1.11 E+01	5.89 E+00	1.92 E+01	7.30 E+01
Fluoride	7	6	DL	2.21 E+01	2.14 E+00	2.52 E+01	3.50 E+01
Iron	12	7	DL	5.46 E+01	1.07 E+01	6.92 E+01	1.56 E+02
Magnesium	12	1	LM	5.17 E+02	3.28 E+02	9.64 E+02	4.03 E+03
Mercury	12	3	LM	2.22 E-01	3.36 E-02	2.68 E-01	4.80 E-01
Nickel	12	9	DL	1.12 E+01	7.26 E-01	1.22 E+01	1.70 E+01
Nitrate	12	8	LM	9.83 E+02	5.10 E+02	1.68 E+03	4.98 E+03
Potassium	12	1	LM	4.07 E+02	1.28 E+02	5.81 E+02	1.71 E+03
Sodium	12	1	LM	2.87 E+03	2.08 E+03	5.71 E+03	2.56 E+04
Sulfate	12	5	LM	2.04 E+03	1.10 E+03	3.54 E+03	1.30 E+04
Sulfide	12	10	DL	6.73 E+03	5.36 E+03	1.40 E+04	6.56 E+04
Uranium	12	2	MR	1.54 E-01	4.33 E-02	2.13 E-01	4.75 E-01
Vanadium	12	11	DL	5.00 E+00	1.17 E-07	5.00 E+00	5.00 E+00

Table 3-2. Historical Waste Analysis Results of 242-A Evaporator Process Condensate. (sheet 2 of 4)

Parameter	N[b]	MOA[c]	Method[d]	Concentration[a] (ppb) Mean	StdErr[e]	90%CILim[f]	Maximum
Zinc	12	6	LM	7.33 E+00	2.89 E+00	1.13 E+01	3.40 E+01
Acetone	11	0	NA	1.10 E+03	4.29 E-02	1.69 E+03	5.10 E+03
Ammonia	12	0	NA	7.55 E-04	2.25 E-04	1.06 E+05	2.50 E+05
Benzaldehyde	1	0	NA	2.30 E+01	NA	NA	2.30 E+01
Benzyl alcohol	1	0	NA	1.00 E-01	NA	NA	1.00 E+01
Butanal	4	0	NA	1.20 E+02	5.25 E+01	2.06 E+02	2.30 E+02
1-Butanol (butyl alcohol)	10	0	NA	3.99 E+02	1.37 E+02	5.89 E+02	1.13 E+03
Butoxydiglycol	1	0	NA	1.10 E+01	NA	NA	1.10 E+01
2-Butoxyethanol	10	0	NA	4.82 E-02	1.08 E+02	6.33 E+02	9.20 E+02
Butoxyglycol	6	0	NA	8.48 E-01	1.36 E+01	1.05 E+02	1.30 E+02
Dodecane	2	0	NA	4.30 E+01	3.00 E+00	5.22 E+01	4.60 E+01
Ethoxytriethylene glycol	1	0	NA	1.50 E+02	NA	NA	1.50 E+02
Heptadecane	1	0	NA	1.80 E+01	NA	NA	1.80 E+01
Hexadecane	1	0	NA	1.70 E+01	NA	NA	1.70 E+01
Hexanoic acid	1	0	NA	7.00 E+01	NA	NA	7.00 E+01
2-Hexanone (methyl n-butyl ketone)	5	0	NA	1.12 E+01	2.60 E+00	1.52 E+01	2.00 E+01
Methyl ethyl ketone (2-Butanone)	12	5	LM	4.17 E+01	1.21 E+01	5.83 E+01	1.20 E+02
Methoxydiglycol	1	0	NA	2.80 E+01	NA	NA	2.80 E+01
Methoxytriglycol	1	0	NA	3.70 E+02	NA	NA	3.70 E+02
MIBK (hexone)[g]	7	1	DL	1.46 E+01	8.95 E+00	2.75 E+01	6.80 E+01
N-Nitrosodimethylamine	12	11	DL	1.39 E+01	3.92 E+00	1.93 E+01	5.70 E+01
Pentadecane	1	0	NA	2.00 E+01	NA	NA	2.00 E+01
2-Pentanone (methyl n-propyl ketone)	4	0	NA	9.75 E+00	9.46 E-01	1.13 E+01	1.10 E+01
Phenol	12	11	DL	1.19 E+01	1.92 E+00	1.45 E+01	3.30 E+01
2-Propanol	2	0	NA	1.60 E+01	6.00 E+00	3.45 E+01	2.20 E+01
Pyridine	12	11	DL	5.04 E+02	4.17 E+00	5.10 E+02	5.50 E+02
Tetradecane	9	0	NA	1.16 E+02	5.17 E+01	1.88 E+02	4.40 E+02
Tetrahydrofuran	6	0	NA	1.98 E+01	2.94 E+00	2.42 E+01	3.00 E+01
Tributylphosphate	11	0	NA	3.30 E+03	1.81 E+03	5.79 E+03	2.06 E+04
Tridecane	9	0	NA	1.01 E+02	4.51 E+01	1.64 E+02	3.50 E+02
Triglyme	1	0	NA	9.00 E+01	NA	NA	9.00 E+01
Alpha activity (pCi/L)[h]	10	0	LM	7.52 E-01	1.55 E-01	9.69 E-01	1.62 E+00
Beta activity (pCi/L)[h]	12	1	DL	1.29 E+03	4.51 E+02	1.90 E+03	4.34 E+03
Conductivity (μS)	12	0	NA	1.56 E+02	3.44 E+01	2.03 E+02	4.70 E+02
pH (dimensionless)	12	0	NA	9.42 E+00	2.19 E-01	9.72 E+00	1.04 E+01
Temperature (°C)	7	0	NA	2.66 E+01	3.12 E+00	3.11 E+01	3.90 E+01
TOC	12	1	LM	1.76 E+04	5.42 E+03	2.50 E+04	5.61 E+04
<u>Ammonia Scrubber Feed</u>							
Aluminum	10	1	LM	9.44 E+02	1.44 E+02	1.15 E+03	1.77 E+03
Arsenic (EP toxic)	2	2	NA	<5.00 E+01	0.00 E+00	<5.00 E+01	<5.00 E+01
Barium	10	8	DL	6.30 E+00	2.13 E-01	6.60 E+00	8.00 E+00
Barium (EP toxic)	2	0	NA	2.31 E+02	5.00 E-01	2.33 E+02	2.32 E+02
Boron	4	3	DL	1.07 E+01	7.50 E-01	1.20 E+01	1.30 E+01
Cadmium (EP toxic)	2	2	NA	<1.00 E+01	0.00 E+00	<1.00 E+01	<1.00 E+01
Calcium	10	0	NA	3.46 E+03	6.91 E+02	4.42 E+03	8.32 E+03
Chloride	10	7	DL	7.00 E+02	1.79 E+02	9.48 E+02	2.30 E+03
Chromium (EP toxic)	2	2	NA	<5.00 E+01	0.00 E+00	<5.00 E+01	<5.00 E+01
Copper	10	9	DL	1.02 E+01	2.00 E-01	1.05 E+01	1.20 E+01
Fluoride[h]	10	4	DL	1.47 E+02	1.03 E+02	2.91 E+02	1.07 E+03
Iron	10	6	LM	2.77 E+01	5.65 E+00	3.55 E+01	6.70 E+01
Lead (EP toxic)	2	2	NA	<5.00 E+01	0.00 E+00	<5.00 E+01	<5.00 E+01
Magnesium	10	8	DL	1.20 E+02	6.98 E+01	2.17 E+02	7.48 E+02
Manganese	10	9	DL	5.00 E+00	1.01 E-07	5.00 E+00	5.00 E+00

Table 3-2. Historical Waste Analysis Results of 242-A Evaporator Process Condensate. (sheet 3 of 4)

Parameter	N[b]	MDA[c]	Method[d]	Concentration[a] (ppb)			
				Mean	StdErr[e]	90%CILim[f]	Maximum
Mercury	10	4	LM	1.79 E-01	5.11 E-02	2.50 E-01	5.60 E-01
Mercury (EP toxic)	2	2	NA	<1.00 E+01	0.00 E+00	<1.00 E+01	<1.00 E+01
Nickel	10	9	DL	1.04 E+01	4.00 E-01	1.10 E+01	1.40 E+01
Postassium	10	0	NA	5.11 E+03	2.02 E+03	7.92 E+03	1.57 E+04
Selenium (EP toxic)	2	2	NA	<5.00 E+01	0.00 E+00	<5.00 E+01	<5.00 E+01
Silicon	4	0	NA	6.72 E+03	9.11 E+02	8.22 E+03	9.40 E+03
Silver (EP toxic)	2	2	NA	5.00 E+01	0.00 E+00	<5.00 E+01	<5.00 E+01
Sodium	10	0	NA	4.02 E+03	3.25 E+03	8.55 E+03	3.32 E+04
Strontium	10	6	DL	1.85 E+00	1.81 E+01	2.10 E+01	3.00 E+01
Sulfate	10	0	NA	2.01 E+03	2.75 E+02	2.40 E+03	3.90 E+03
Uranium	10	4	MR	5.43 E-01	2.42 E-01	8.80 E-01	2.03 E+00
Vanadium	10	7	DL	5.50 E+00	2.69 E-01	5.87 E+00	7.00 E+00
Zinc	10	5	LM	6.33 E+00	1.49 E+00	8.41 E+00	1.70 E+01
Acetone	9	0	NA	1.03 E+03	1.70 E+02	1.27 E+03	2.16 E+03
Ammonia	10	0	NA	8.20 E+05	1.82 E+05	1.07 E+06	2.19 E+06
Benzyl alcohol[h]	8	4	DL	1.19 E+01	1.09 E+00	1.34 E+01	1.70 E+01
Butanal	3	0	NA	8.67 E+00	2.33 E+00	1.31 E+01	1.30 E+01
1-Butanol (butyl alcohol)	9	0	NA	2.84 E+04	1.29 E+04	4.64 E+04	1.21 E+05
Butoxydiglycol	1	0	NA	2.70 E+01	NA	NA	2.70 E+01
2-Butoxyethanol	6	0	NA	2.89 E+02	7.74 E+01	4.03 E+02	4.90 E+02
Butoxyglycol	6	0	NA	1.88 E+02	4.48 E+01	2.54 E+02	3.60 E+02
Butoxytriethyleneglycol	1	0	NA	3.50 E+01	NA	NA	3.50 E+01
Ethanol	1	0	NA	2.00 E+00	NA	NA	2.00 E+00
2-Hexanone (methyl n-butyl alcohol)	6	3	DL	3.20 E+01	1.31 E+01	5.13 E+01	7.90 E+01
Methyl ethyl ketone (2-Butanone)	10	1	LM	3.38 E+01	7.56 E+00	4.43 E+01	9.30 E+01
2-Methylnonane	2	0	NA	1.55 E+01	1.50 E+00	2.01 E+01	1.70 E+01
2-Propanol	3	0	NA	1.90 E+01	4.51 E+00	2.75 E+01	2.40 E+01
Tetradecane	6	0	NA	1.40 E+01	2.62 E+00	1.79 E+01	2.50 E+01
Tetrahydrofuran	9	0	NA	2.92 E+01	7.85 E+00	4.02 E+01	8.10 E+01
Tributylphosphate	13	2	LM	3.95 E+03	9.39 E+02	5.22 E+03	1.01 E+04
Tridecane	6	0	NA	1.27 E+01	3.57 E+00	1.79 E+01	2.80 E+01
Unknown	9	0	NA	2.88 E+02	1.29 E+02	4.69 E+02	1.13 E+03
Unknown aliphatic HC	1	0	NA	1.20 E+01	NA	NA	1.20 E+01
Alpha activity (pCi/L)	8	6	DL	3.72 E-01	1.05 E-01	5.20 E-01	1.01 E+00
Beta activity (pCi/L)	10	0	NA	4.11 E+03	1.41 E+03	6.07 E+03	1.25 E+04
Conductivity (µS)	10	0	NA	3.19 E+02	4.49 E+01	3.82 E+02	5.90 E+02
pH (dimensionless)	10	0	NA	1.05 E+01	2.31 E-01	1.08 E+01	1.13 E+01
TDS	2	0	NA	2.25 E+04	1.50 E+03	2.71 E+04	2.40 E+04
Temperature (°C)	6	0	NA	2.76 E+01	2.31 E+00	3.10 E+01	3.49 E+01
TOC	10	0	NA	2.70 E+04	6.87 E+03	3.66 E+04	7.85 E+04
Salt well Feed							
Aluminum	4	0	NA	5.93 E+02	2.43 E+01	6.33 E+02	6.42 E+02
Calcium	4	0	NA	3.65 E+02	3.43 E+01	4.21 E+02	4.47 E+02
Mercury	4	0	NA	1.83 E-01	1.97 E-02	2.15 E-01	2.30 E-01
Nickel	4	3	DL	1.07 E+01	7.50 E-01	1.20 E+01	1.30 E+01
Potassium	4	0	NA	4.81 E+03	2.62 E+02	5.24 E+03	5.28 E+03
Sodium	4	0	NA	1.74 E+03	4.27 E+02	2.44 E+03	2.73 E+03
Zinc	4	1	DL	1.55 E+01	9.51 E+00	3.11 E+01	4.40 E+01
Acetone	4	0	NA	8.00 E+02	1.49 E+02	1.04 E+03	1.20 E+03
Ammonia	4	0	NA	7.97 E+04	8.04 E+03	9.29 E+04	8.89 E+04
Benzyl alcohol	1	0	NA	1.10 E+01	NA	NA	1.10 E+01
Butanal	3	0	NA	3.10 E+01	7.23 E+00	4.46 E+01	4.30 E+01
1-Butanol (butyl alcohol)	4	0	NA	3.90 E+02	6.43 E+01	4.95 E+02	5.25 E+02
2-Butoxyethanol	4	0	NA	7.17 E+01	1.22 E+01	9.17 E+01	9.80 E+01

Table 3-2. Historical Waste Analysis Results of 242-A Evaporator Process Condensate. (sheet 4 of 4)

				Concentration[a] (ppb)			
Parameter	N[b]	MDA[c]	Method[d]	Mean	StdErr[e]	90%CILim[f]	Maximum
Butoxyglycol	4	0	NA	7.02 E+02	4.99 E+01	7.83 E+02	8.06 E+02
Ethoxytriethylene glycol	3	0	NA	8.20 E+01	2.57 E-01	1.30 E-02	1.20 E+02
2-Hexanone (methyl n-butyl ketone)	4	0	NA	6.25 E+00	1.31 E+00	8.40 E+00	1.00 E+01
Methoxydiglycol	1	0	NA	5.20 E+01	NA	NA	5.20 E+01
Methoxytriglycol	1	0	NA	6.50 E+01	NA	NA	6.50 E+01
Methyl ethyl ketone (2-Butanone)	4	0	NA	3.25 E+01	3.84 E+00	3.88 E-01	4.40 E+01
MIBK (hexone)	1	0	NA	8.00 E+00	NA	NA	8.00 E+00
2-Propanol	4	0	NA	2.35 E+01	5.55 E+00	3.26 E+01	3.40 E+01
Tetradecane	4	0	NA	1.38 E+02	6.60 E+01	2.46 E+02	3.20 E+02
Tetrahydrofuran	4	0	NA	1.07 E+02	2.74 E+01	1.52 E+02	1.70 E+02
Tributylphosphate	4	0	NA	3.64 E+03	9.53 E+02	5.21 E+03	6.15 E+03
Tridecane	4	0	NA	1.45 E+02	6.52 E+01	2.52 E+02	3.00 E+02
Unknown	4	0	NA	4.47 E+01	2.46 E+00	4.88 E+01	5.10 E+01
Beta activity (pCi/L)	4	0	NA	1.27 E+03	1.36 E+02	1.50 E+03	1.61 E+03
Conductivity (µS)	4	0	NA	8.32 E+01	2.17 E+00	8.68 E+01	8.70 E+01
pH (dimensionless)	4	0	NA	1.01 E+01	4.75 E-02	1.01 E+01	1.01 E+01
TOC	4	0	NA	2.36 E+04	2.22 E+03	2.72 E+04	2.97 E+04
TOX (as Cl)	4	3	DL	1.15 E+01	7.98 E+00	2.46 E+01	3.50 E+01

Reference: WHC 1990g.

[a] Concentration in ppb (parts per billion) except where noted.

[b] N - Number of samples analyzed.

[c] MDA - Number of samples with results below the detection limit.

[d] Method - Replacement method for results below the detection limit:
DL -- replacement by detection limit
LM -- replacement by lognormal plotting position
MR -- replacement by normal plotting position

[e] StdErr - Standard error.

[f] 90%CILim - 90% confidence internal limit. Defined as upper limit of one-tailed 90% confidence interval.

[g] NA - Not applicable.

[h] At least one reported measurement is less than the reported detection limit for data set.

Table 3-3. Analytical Methods Employed on Hanford Site Waste.
(sheet 1 of 2)

Code	Analytical Method	Reference
ABN	Semivolatile organics (GC/MS)	USEPA-8270
AEA	Americium-241	UST-20Am01
AEA	Curium isotopes	UST-20Am/Cm01
AEA	Plutonium isotopes	UST-20Pu01
AEA	Uranium isotopes	UST-20U01
ALPHA	Alpha counting	EPA-680/4-75.1
ALPHA-Ra	Total radium alpha counting	ASTM-D2460
BETA	Beta counting	EPA-680/4-75.1
BETA	Strontium-90	UST-20Sr02
COLIF	Coliform bacteria	USEPA-9131
COLIFMF	Coliform bacteria (membrane filter)	USEPA-9132
COND-Fld	Conductivity-field	ASTM-D1125A
COMD-Lab	Conductivity-laboratory	ASTM-D1125A
CVAA	Mercury	USEPA-7470
CVAA/M	Mercury-mixed matrix	USEPA-7470
DIGC	Direct aqueous injection (GC)	UST-70DIGC
DIMS	Direct aqueous injection (GC/MS)	USEPA-8240 (modified)
DSPEC	Reactive cyanide (distillation, spectroscopy)	SEPA-CHAPTER 7
DTITRA	Reactive sulfide (distillation, titration)	SEPA-CHAPTER 7
FLUOR	Uranium (fluorometry)	ASTM-D2907-83
GEA	Gamma energy analysis spectroscopy	ASTM-D3649-85
GFAA	Arsenic (AA, furnace technique)	USEPA-7060
GFAA	Lead (AA, furnace technique)	USEPA-7421
GFAA	Selenium (AA, furnace technique)	USEPA-7740
GFAA	Thallium (AA, furnace techinque)	USEPA-7841
IC	Ion chromatography	EPA-600/4-84-01
ICP	Atomic emission spectroscopy (ICP)	USEPA-6010
ICP/M	Atomic emission spectroscopy (ICP) - Mixed matrix	USEPA-6010
IGNIT	Pensky-Martens closed-cup ignitability	USEPA-1010
ISE	Fluoride-low detection limit	ASTM-D1179-80-B
ISE	Ammonium ion	ASTM-D1426-D
LALPHA	Alpha activity-low detection limit	EPA-680/4-75/1
LEPD	Iodine-129	UST-20I02
LSC	Carbon-14	UST-20C01
LSC	Tritium	UST-20H03
LTOX	Total organic halides-low detection limit	USEPA-9020
PH-Fld	pH-field	USEPA-9040
PH-Lab	pH-laboratory	USEPA-9040

Table 3-3. Analytical Methods Employed on Hanford Site Waste.
(sheet 2 of 2)

Code	Analytical Method	Reference
SPEC	Total and amenable cyanide (spectroscopy)	USEPA-9010
SPEC	Hydrazine-low detection limit (spectroscopy)	ASTM-D1385
SSOLID	Suspended solids	SM-208D
TC	Total carbon	USEPA-9060
TDS	Total dissolved solids	SM-208B
TEMP-Fld	Temperature-field	Local
TITRA	Alkalinity-method B (titration)	ASTM-D1067B
TITRA	Sulfides (titration)	USEPA-9030
TOC	Total organic carbon	USEPA-9060
TOX	Total organic halides	USEPA-9020
VOA	Volatile organics (GC/MS)	USEPA-8240

Analytical method acronyms:
- AA - atomic absorption spectroscopy
- GC - gas chromatography
- MS - mass spectrometry
- ICP - inductively coupled plasma spectroscopy

References:

ASTM *1986 Annual Book of ASTM Standards*, American Society for Testing and Materials, Philadelphia, Pennsylvania.

EPA Various methods of the U.S. Environmental Protection Agency, Washington, D.C.

Local Methods developed for the Hanford Site, Richland, Washington

SM *Standard Methods for the Examination of Water and Wastewater*, 16th ed., American Public Health Association, American Water Works Association and Water Pollution Control Federation, Washington, D.C.

USEPA *Test Methods for Evaluating Solid Waste Physical/Chemical Methods*, 3rd ed., SW-846, U.S. Environmental Protection Agency, Washington, D.C.

UST Methods of the United States Testing Company, Inc., Richland, Washington.

Table 3-4. Comparison of Analysis Results Between 242-A Evaporator Process Condensate and Background Raw Water.
(sheet 1 of 2)

Parameter	Raw water concentration[a/b] Average	Raw water concentration[a/b] U90%CI[c]	Process condensate average	Concentration[b] U90%CI
<u>Miscellaneous</u>				
Alpha activity (pCi/L)	8.85 E-01	1.3 E+00	7.0 E-01	7.5 E-01
Beta activity (pCi/L)	4.47 E+00	6.0 E+00	2.1 E+03	2.2 E+03
Conductivity-field (µS)	9.32 E+01	1.3 E+02	2.9 E+02	3.1 E+02
Conductivity-laboratory (µS)	NT[d]	NA[e]	1.5 E+02	1.6 E+02
pH-field	6.9 E+00	6.0 E+00	9.9 E+00	1.0 E+01
pH-laboratory	NT	NA	9.8 E+00	9.8 E+00
Temperature-field (°C)	1.64 E+01	2.2 E+01	2.9 E+01	3.0 E+01
Total organic carbon (TOC)	1.36 E+03	1.6 E+03	2.6 E+04	2.7 E+04
Total dissolved solids (TDS)	NT	NA	2.3 E+04	2.7 E+04
Total organic halides (TOX)	NT	NA	3.5 E+01	NA
<u>Inorganic cations</u>				
Aluminum	NT	NA	8.4 E+02	8.6 E-02
Ammonium	(BDL)[f]	NA	4.1 E+05	4.3 E+05
Barium	2.80 E+01	3.1 E+01	6.8 E+00	7.2 E+00
Boron	(BDL)	NA	1.3 E+01	NA
Cadmium	2.40 E+00	3.2 E+00	5.0 E+00	NA
Calcium	1.84 E+04	2.0 E+04	2.7 E+03	2.8 E+03
Copper	1.06 E+01	1.2 E+01	2.6 E+01	3.5 E+01
Iron	6.36 E+01	8.7 E+01	6.3 E+01	7.0 E+01
Magnesium	4.19 E+03	4.6 E+03	5.0 E+02	6.0 E+02
Manganese	9.80 E+00	1.3 E+01	5.0 E+00	NA
Mercury	(BDL)	NA	3.0 E-01	3.1 E-01
Nickel	1.04 E+01	1.1 E+01	1.4 E+01	1.5 E+01
Potassium	7.95 E+02	8.5 E+02	2.6 E+03	2.8 E+03
Silicon	(BDL)	NA	6.8 E+03	7.6 E+03
Sodium	2.26 E+03	2.5 E+03	3.3 E+03	3.7 E+03
Vanadium	(BDL)	NA	5.2 E+00	5.6 E+00
Zinc	2.00 E+01	3.9 E+01	1.3 E+01	1.4 E+01
<u>Inorganic anions</u>				
Chloride	8.71 E+02	1.1 E+03	1.0 E+03	1.2 E+03
Fluoride (IC)[g]	(BDL)	NA	2.1 E+03	NA
Flouride (ISE)[h]	NT	NA	4.0 E+01	4.3 E+01
Nitrate	9.96 E+02	1.8 E+03	2.8 E+03	3.8 E+03
Sulfate	1.06 E+04	1.1 E+04	2.6 E+03	2.8 E+03
Sulfide	(BDL)	NA	6.8 E+03	1.3 E+05
<u>Acids</u>				
Caproic acid	(BDL)	NA	7.0 E+01	NA
<u>Parraffins</u>				
2-Methylnonane	(BDL)	NA	1.6 E+01	2.0 E+01
Dodecane	(BDL)	NA	4.3 E+01	5.2 E+01
Heptadecane	(BDL)	NA	1.8 E+01	NA
Hexadecane	(BDL)	NA	1.7 E+01	NA
Pentadecane	(BDL)	NA	2.0 E+01	NA
Tetradecane	(BDL)	NA	7.6 E+01	8.3 E+01
Tridecane	(BDL)	NA	7.0 E+01	7.7 E+01
<u>Alcohols</u>				
2-Propanol	(BDL)	NA	2.2 E+01	2.4 E+01
Butyl alcohol	(BDL)	NA	9.8 E+03	1.1 E+04
Ethyl alcohol	(BDL)	NA	2.0 E+00	NA
<u>Aldehydes</u>				
Butyraldehyde	(BDL)	NA	5.6 E+01	6.2 E+01

Table 3-4. Comparison of Analysis Results Between 242-A Evaporator Process Condensate and Background Raw Water.
(sheet 2 of 2)

Parameter	Raw water concentration[a/b] Average	Raw water concentration[a/b] U90%CI[c]	Process condensate average	Concentration[b] U90%CI
Ketones				
Acetone	(BDL)	NA	9.8 E+02	1.0 E+03
Methyl ethyl ketone	(BDL)	NA	5.1 E+01	5.3 E+01
Methyl n-butyl ketone	(BDL)	NA	1.3 E+01	1.4 E+01
Methyl n-propyl ketone	(BDL)	NA	9.3 E+00	9.7 E+00
MIBK (hexone)	(BDL)	NA	1.1 E+01	1.4 E+01
Cyclics				
Benzaldehyde	(BDL)	NA	2.3 E+01	NA
Benzyl alcohol	(BDL)	NA	1.3 E+01	1.4 E+01
Phenol	(BDL)	NA	3.3 E+01	NA
Tetahydrofuran	(BDL)	NA	3.7 E+01	3.9 E+01
Esters				
Tributyl phosphate	(BDL)	NA	3.9 E+03	4.1 E+03
Nitrogen containing organics				
3,5-Dimethylpyridine	(BDL)	NA	2.1 E+01	2.3 E+01
Dimethylnitrosamine	(BDL)	NA	5.7 E+01	NA
Pyridine	(BDL)	NA	5.5 E+02	NA
Ethers and glycols				
2-Butoxyethanol	(BDL)	NA	3.8 E+02	4.0 E+02
Butoxydiglycol	(BDL)	NA	1.9 E+01	4.4 E+01
Butoxyglycol	(BDL)	NA	2.8 E+02	2.9 E+02
Butoxytriethylene glycol	(BDL)	NA	3.5 E+01	NA
Ethoxytriethylene glycol	(BDL)	NA	9.9 E+01	1.2 E+02
Methoxydiglycol	(BDL)	NA	4.0 E+01	7.7 E+01
Methoxytriglycol	(BDL)	NA	2.2 E+02	6.9 E+02
Triglyme	(BDL)	NA	9.0 E+01	NA

[a] Background data was taken from raw water at the 200 East Area (WHC 1990g).
[b] Concentrations are reported as ppb (parts per billion) except where noted.
[c] U90%CI - Upper limit of one-tailed 90% confidence interval.
[d] NT - Not tested.
[e] NA - Not applicable.
[f] (BDL) - Below detectable limits.
[g] IC - Ion chromatography.
[h] ISE - Ion-selective electrode.

Table 3-5. The 242-A Evaporator Process Condensate - Toxic Dangerous Waste Mixture Designation Calculations[a]. (sheet 1 of 4)

Compound	Toxic category	Equivalent concentration (EC%)
AMMONIA SCRUBBER FEED:		
Inorganics[b]		
Aluminum sulfate	D	1.49 E-08
Barium chloride	C	1.44 E-09
Calcium tetraborate	D	5.41 E-10
Copper (II) chloride	A	3.18 E-07
Iron (III) fluoride	B	1.03 E-07
Magnesium chloride	D	1.22 E-08
Mercury (II) chloride	A	4.87 E-09
Nickel (II) hydroxide	C	2.49 E-09
Potassium chloride	D	3.33 E-10
Potassium fluoride	C	7.30 E-08
Sodium metasilicate	D	3.26 E-07
Vanadium (V) oxide	B	1.51 E-08
Zinc sulfate	C	2.98 E-09
Organics[c]		
Acetone	D	1.27 E-08
Ammonia	B	1.07 E-03
Benzyl alcohol	C	1.34 E-10
Butanal	C	1.31 E-10
Butoxydiglycol	D	2.70 E-10
2-Butoxyethanol	D	4.03 E-08
Butoxytriethylene glycol	D	3.50 E-10
Butyl alcohol (1-butanol)	D	4.64 E-07
Ethyl alcohol	D	1.11 E-05
2-Hexanone (mkethyl n-butyl ketone)	D	5.13 E-10
2-Propanol	D	2.75 E-10
Methyl ethyl ketone (2-butanone)	D	4.43 E-10
Tetrahydrofuran	D	4.02 E-09
Tributyl phosphate	D	5.22 E-08
Total equivalent concentration		1.08 E-03
PUREX CLADDING REMOVAL WASTE:		
Inorganics[b]		
Barium chloride	C	9.10 E-12
Calcium chloride	D	1.49 E-09
Magnesium chloride	D	2.38 E-09
Mercury (II) chloride	A	8.34 E-09
Potassium chloride	D	1.24 E-10

Table 3-5. The 242-A Evaporator Process Condensate - Toxic Dangerous Waste Mixture Designation Calculations[a]. (sheet 2 of 4)

Compound	Toxic category	Equivalent concentration (EC%)
Organics[c]		
Acetone	D	2.54 E-06
Ammonia	B	8.12 E-04
Benzyl alcohol	C	1.80 E-10
Butanal	C	6.57 E-10
2-Butoxyethanol	D	7.20 E-08
Butyl alcohol (1-butanol)	D	7.51 E-07
3,5-Dimethyl pyridine	B	2.45 E-06
2-Hexanone (methyl n-butyl ketone)	D	1.11 E-10
Methyl ethyl ketone (2-butanone)	D	8.76 E-10
MIBK (hexone)	D	4.96 E-11
2-Pentanone k(methyl n-propyl ketone)	D	1.08 E-10
2-Propanol	D	3.90 E-10
Tetrahydrofuran	D	1.73 E-09
Tributyl phosphate	D	5.55 E-08
Total equivalent concentration		8.16 E-04
LINKED FEED:		
Inorganics[b]		
Aluminum nitrate	C	3.30 E-07
Barium chloride	C	1.71 E-09
Cadmium chloride	B	7.94 E-09
Copper (II) chloride	A	7.63 E-07
Hydrogen sulfide (dibasic)	B	1.45 E-05
Iron (III) chloride	C	3.06 E-08
Iron (III) fluoride	B	5.00 E-08
Magnesium chloride	D	5.82 E-09
Magnesium sulfate	D	4.43 E-08
Mercury (II) chloride	A	6.81 E-09
Nickel (II) hydroxide	C	3.61 E-09
Potassium sulfide (dibasic)	B	1.54 E-06
Uranyl nitrate	B	6.64 E-10
Vanadium (V) oxide	B	1.68 E-08
Zinc nitrate	C	6.14 E-09
Organics[c]		
Acetone	D	1.69 E-08
Ammonium	B	1.06 E-04
Benzaldehyde	D	2.30 E-10
Benzyl alcohol	C	1.00 E-10

Table 3-5. The 242-A Evaporator Process Condensate - Toxic Dangerous Waste Mixture Designation Calculations[a]. (sheet 3 of 4)

Compound	Toxic category	Equivalent concentration (EC%)
Butanal	C	2.06 E-09
Butoxydiglycol	D	1.10 E-10
2-Butoxyethanol	D	6.33 E-08
Butyl alcohol (1-butanol)	D	5.89 E-09
Dimethylnitrosamine	D	1.93 E-08
Ethoxytriethylene glycol	D	1.50 E-09
Hexanoic acid	C	7.00 E-09
2-Hexanone (methyl n-butyl ketone)	D	1.52 E-10
Methoxydiglycol	C	2.80 E-09
Methoxytriglycol	D	3.70 E-09
Methyl ethyl ketone (2-butanone)	D	5.83 E-10
MIBK (hexone)	D	2.75 E-10
2-Pentanone (methyl n-propyl ketone)	D	1.13 E-10
Phenol	C	1.45 E-08
2-Propanol	D	3.45 E-10
Pyridine	C	5.10 E-08
Tetrahydrofuran	D	2.42 E-09
Tributyl phosphate	D	5.79 E-08
Total Equivalent Concentration		1.24 E-04
SALT WELL FEED:		
Inorganics[b]		
Nickel (II) hydroxide	C	1.89 E-09
Organics[c]		
Acetone	D	1.04 E-08
Ammonia	B	9.29 E-05
Benzyl alcohol	C	1.10 E-10
Butanal	C	4.46 E-10
2-Butoxyethanol	D	9.17 E-09
Butyl alcohol (1-butanol)	D	4.95 E-09
Ethoxytriethylene glycol	D	1.30 E-09
2-Hexanone (methyl n-butyl ketone)	D	8.40 E-11
Methoxydiglycol	C	5.20 E-09
Methoxytriglycol	D	6.50 E-10
Methyl ethyl ketone (2-butanone)	D	3.88 E-10
MIBK (hexone)	D	8.00 E-11
2-Propanol	D	3.26 E-10

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Table 3-5. The 242-A Evaporator Process Condensate - Toxic Dangerous Waste Mixture Designation Calculations[b]. (sheet 4 of 4)

Compound	Toxic category	Equivalent concentration (EC%)
Tetrahydrofuran	D	1.52 E-08
Tributyl phosphate	D	5.21 E-08
Total equivalent concentration		9.30 E-05

References: WHC 1990g; Jungfleisch 1990, pp. C-1 to C-17.

[a] See WAC 173-303-084(5) and WAC 173-202-9906.

[b] Calculations are based on compounds, hypothesized to be present.

[c] Calculations based on actual sample data.

Table 3-6. The 242-A Evaporator Process Condensate - Carcinogenic Dangerous Waste Mixture Calculations[a].

Compound	Carcinogenic total %
AMMONIA SCRUBBER FEED:	
Nickel (II) hydroxide[b]	1.73 E-08
Total carcinogenic	1.73 E-08
PUREX CLADDING REMOVAL WASTE:	
Total carcinogenic	0.00 E+00
LINKED FEED:	
Cadmium chloride[b]	7.94 E-07
Nickel (II) hydroxide[b]	3.61 E-06
N-Nitrosodimethylamine[c]	1.93 E-06
Total carcinogenic	6.33 E-06
SALT WELL FEED:	
Nickel (II) hydroxide[b]	2.49 E-06
Total carcinogenic	2.49 E-06

Reference: WHC 1990g.

[a] See WAC 173-303-084(7).

[b] Calculations are based on compounds hypothesized to be present.

[c] Calculations based on actual data.

Table 3-7. The 242-A Evaporator Process Condensate - Dangerous Waste Characteristics.[a]

Dangerous characteristic	Regulatory threshold level	Ammonia scrubber feed	PUREX cladding removal waste	Linked feed	Salt well feed
Ignitability index[b] (%)	NA[c]	0.00483	0.00786	0.00198	0.000192
Corrosivity - pH	<2 or >12.5	10.83	10.62	9.72	10.13
Reactivity (mg/kg)					
Hydrogen cyanide	250	ND[d]	ND	ND	ND
Hydrogen sulfide	500	ND	ND	14.9	ND
Toxicity[e] (mg/L)					
Barium	100.0	0.0066	0.006	0.006	ND
Cadmium	1.0	ND	ND	0.00259	ND
Mercury	0.2	0.00025	0.000616	0.000268	0.000215
Methyl ethyl ketone	200.0	0.0443	0.0876	0.0583	0.0383

Reference: WHC 1990g.

[a] Waste designation performed using concentrations associated with the upper limit of the one-tailed 90% confidence interval.

[b] Ignitability index calculated as sum of substances with a flash point < 140 °F. Waste with index below 1% is not considered ignitable.

[c] NA - not applicable

[d] ND - not detected.

[e] Total analyte concentrations are used in lieu of TCLP test results because data are not available for the leaching test procedure. Waste with total analyte concentrations below the TCLP toxic threshold levels is not toxic dangerous.

Table 3-8. The 242-A Evaporator Process Condensate - Waste Characterization Parameters and Test Methods.

Parameter	Test method	Source[a]	Rationale[b]
Miscellaneous			
Beta activity	USEPA 9310	SW-846	a
pH	USEPA 9040	SW-846	a
Temperature	SM-2550 (Field)	SM	a
Inorganic cations			
Ammonium	ASTM D1426-89	ASTM	a
Volatile organics			
Acetone	USEPA 8240	SW-846	a
Carbon tetrachloride	USEPA 8240	SW-846	a
Methyl ethyl ketone	USEPA 8240[c]	SW-846	a
Methyl isobutyl ketone (hexone)	USEPA 8240[c]	SW-846	a
Methylene chloride	USEPA 8240	SW-846	a
2-Propanol	USEPA 8240	SW-846	a
Tetrahydrofuran	USEPA 8240[c]	SW-846	a
1,1,1-Trichloroethane	USEPA 8240	SW-846	a

[a] Sources:

SW-846 — *Test Methods for Evaluating Solid Waste Physical/Chemical Methods*, 3rd Ed., SW-846, U.S. Environmental Protection Agency, Washington, D.C., September, 1986.

SM — *Standard Methods for the Examination of Water and Wastewater*, 17th Ed., American Public Health Association, American Water Works Association and Water Pollution Control Federation, Washington, D.C., 1989.

ASTM — *1989 Annual Book of ASTM Standards*, American Society for Testing and Materials, Philadelphia, Pennsylvania.

[b] a = Verify compatibility with LERF liner system.

[c] Analysis for this parameter may require method modification.

Table 3-9. Sampling Requirements at the LERF Basins.

Frequency:
Basins actively receiving process condensate--at one-half capacity [i.e., 3.25 million gallons (12.3 million liters)] and full capacity [i.e., 6.5 million gallons (24.4 million liters)], or every 6 months, whichever comes first.
Basins that are full--every 6 months.
Type of sample: One-time grab
Sampler mode of operation: Manual, grab
Total volume required per sample[a]: 1.7 liters
<u>Initial round of sampling</u>
Number of samples per sample riser[b]: 3
Total number of samples: 24 samples
<u>Subsequent routine rounds of sampling</u>
Number of samples per sample riser: See footnote [c]
Total number of samples: See footnote [c]

[a] See Table 3-10 for required volumes, containers, preservation techniques, and holding times.

[b] Samples corresponding to top, middle and bottom of water column in each sample riser.

[c] Depending on the results of the initial round of sampling, the number of samples may be reduced and/or the ninth sampling location at the center of the basin may be employed. See Section 3.2.2 for discussion.

Table 3-10. Required Volumes, Containers, Preservation Techniques and Holding Times.

Parameters	Volume	Container	Preservation	Holding time
Miscellaneous				
Beta activity	1 liter	2 l HDPE	$HNO_3 < 2$	6 months
pH	100 ml	250 ml HDPE	Cool 4 °C	Analyze immediately*
Temperature	1 liter	2 l HDPE	None	Analyze immediately
Inorganic cations				
Ammonium	500 ml	1 l HDPE	Cool 4 °C $H_2SO_4 < 2$	28 days
Volatile organics	2-40 ml (80 ml)	2-40 ml glass vial	Cool 4 °C	14 days

* pH and temperature are measured when the sample is taken. Therefore, there is no holding time.

CONTENTS

6.0 PROCEDURES TO PREVENT HAZARDS [F]

The LERF is designed and operated to minimize exposure of the general public and operating personnel to dangerous waste. This chapter describes the security, inspection frequencies and procedures, and emergency response equipment available to prevent, minimize, and control exposure.

6.1 SECURITY [F-1]

The following sections describe the security measures, equipment, and warning signs used to control entry to the LERF.

6.1.1 Security Procedures and Equipment [F-1a]

The following sections describe the 24-hour surveillance system, warning signs, and barriers used to provide security and controlled access to the LERF.

6.1.1.1 24-hour Surveillance System [F-1a(1)]. The entire Hanford Site is a controlled access area and is expected to remain so for the foreseeable future. The Hanford Site maintains around-the-clock surveillance for protection of government property, classified information, and special nuclear material. The Hanford Patrol maintains a continuous presence of armed guards to provide additional security.

6.1.1.2 Barrier and Means to Control Entry [F-1a(2),(2a),(2b)]. Manned barricades are maintained around the clock at checkpoints on vehicular access roads leading to the Hanford Site. Vehicle operators desiring to enter the 200 East Area of the Hanford Site must display a U.S. Department of Energy-issued security identification badge before being admitted.

The LERF is located in the 200 East Area. Access to the 200 East Area is gained through one of two manned barricades. All personnel entering or leaving the 200 East Area must display a U.S. Department of Energy-issued security identification badge indicating authorization to enter the area and submit to a search of personal items carried into and out of the area. Access to the LERF is limited to operators and other appropriate personnel on an as-needed basis.

The entire perimeter of the 200 East Area is surrounded by a 7-foot (2.1-meter) chain link fence topped with 3 strands [1 foot (30 centimeters)] of barbed wire (referred to as the 200 East Area limited access perimeter fence). Within the 200 East Area, the LERF is surrounded in its entirety by a separate 7-foot (2.1-meter) chain link fence topped with 3 strands [1 foot (30 centimeters)] of barbed wire extended outward at a 45° angle (referred to as the operational security fence). The location of the fences, entrance gates, and details of the fence construction at the LERF are shown on Drawing H-2-81570 in Appendix 2A and Drawing H-2-79586 in Appendix 4B.

Access to the LERF is gained through two locked and alarmed vehicular gates off the perimeter road. The primary gate is 24 feet (7.3 meters) wide and is adjacent to the operations building, northwest of the basins. A 36-foot-wide (11-meter-wide) emergency gate is located southwest of the basins. An additional entrance to the LERF is through a personnel door in the operations building at the northwest corner of the LERF. Both gates are secured by 120 volt, magnetic proximity sensors (W105-PS1 and W105-PS2). Gate alarms are activated by the opening of the gates. Drawing H-2-79664, sheet 3, in Appendix 4B provides details on the gate alarm system. Power is supplied to the sensors through the power and lighting panel located in the LERF change trailer. The alarm signals are transmitted through a 16AWG messenger cable on poles with messenger hangers at a minimum of 25 feet (7.6 meters) abovegrade. The signals are received at the 242-A Evaporator monitoring and control system. The 242-A Evaporator monitoring and control system is a central monitoring station designed to monitor 242-A Evaporator operations. The system is manned 24 hours a day. Because of its manned status, the system also serves as a monitoring center for other units such as the alarmed gates at the LERF.

Additional security is provided by low-pressure sodium lighting of both the 200 East Area limited access perimeter fence, LERF operational security fence, and the individual basins. The 55 watt, 480 volt fixtures are mounted on 35-foot (10.7-meter) poles at least 25 feet (7.6 meters) abovegrade. Drawing H-2-79664 in Appendix 4B shows the location of the perimeter lighting, operational security lighting, and basin lighting.

6.1.1.3 Warning Signs [F-1a(3)]. Warning signs stating "DANGER--UNAUTHORIZED PERSONNEL KEEP OUT" are posted at each entrance to the LERF and at 100-foot intervals along the operational security fence. The signs at each entrance also provide the names and telephone numbers of personnel to contact in the event of an emergency. The LERF has been designated a "nonreactor nuclear facility" and, therefore, radiation warning signs and "No Smoking" signs also are posted at each entrance and at 100-foot (30-meter) intervals along the operational security fence. All signs at the LERF are written in English, which are legible from a distance of 25 feet (7.6 meters) and visible from all angles of approach. In addition to these signs, the 200 East Area limited access perimeter fence is posted with signs warning against unauthorized entry.

6.1.2 Waiver [F-1b,b(1),b(2)]

Waivers of the security procedures and equipment requirements for the LERF will not be requested. Therefore, the requirements of this section are not applicable to the LERF.

6.2 INSPECTION SCHEDULE [F-2]

The following sections describe inspections for the LERF. The purpose of inspection procedures at the LERF is to prevent malfunctions and deteriorations, human errors, and discharges that could cause or lead to the release of dangerous waste to the environment or pose a threat to human health. Abnormal conditions identified by inspections will be corrected to the degree necessary to prevent hazards to workers, the public, and the environment.

6.2.1 General Inspection Requirements [F-2a]

The content of inspections is described in this section. The schedule and inspection records are retained in the inspection logbooks. The inspection logbooks are maintained by Tank Farms Operations and currently are retained in the 272-AW Building, Room 3, which serves as the main administration building for LERF and the 200 East Area Tank Farms. The LERF inspection records are managed by Tank Farms Operations. Inspection records are retained for a minimum of 3 years. Inspection procedures and inspection frequency are detailed in the LERF operating procedures manual. A current manual is presently maintained in the 272-AW Building, Room 3 and is available for review by regulatory personnel.

6.2.1.1 Types of Problems [F-2a(1)]. Observations made or deficiencies noted during an inspection are recorded in the inspection logbooks. The inspection logbooks are used to help determine the necessary corrective action and problem resolution. Each inspection includes a review of the findings of the previous inspection to determine whether any deficiencies were noted and to ensure that the appropriate corrective action(s) was completed. Key components of the LERF inspection program include the following areas:

- Structural integrity of the basins and piping
- Catch basin secondary containment system integrity
- Evidence of release from basins and piping
- Safety, communications, and emergency equipment
- Security
- Recordkeeping.

6.2.1.2 Frequency of Inspections [F-2a(2)]. When the basins contain waste, the LERF is inspected by operations personnel at the frequency specified in the LERF operating procedures manual. If the basins do not contain waste, the LERF is inspected at a less frequent interval as specified in the LERF operating procedures manual. The LERF also is inspected for run-on, run-off, cover integrity, and erosion problems after significant precipitation events. Chapter 4.0, Section 4.4.9.11, contains the definition of significant precipitation events.

6.2.1.2.1 Other Inspections and Audits Performed at the Liquid Effluent Retention Facility. In addition to the LERF inspections performed by the operators, various inspections and audits of the LERF are performed on a routine and nonroutine basis by other organizations. Included in these additional inspections are the Tank Farms Management Overview Program and Tank Farms Internal Surveillance System. The LERF is addressed by both. Additional inspections include preventive maintenance, fire protection, radiation control, quality assurance, and environmental compliance inspections and audits. The routine inspections and audits are conducted in accordance with the integrated schedule maintained by the operations contractor. The integrated schedule is prepared to verify that the inspection needs of each organization are met, and that there is not an overlap in verification activities.

6.2.1.2.1.1 Tank Farms Management Overview Program. A management overview program for the tank farms and all of its operations has been established. The LERF is managed under this program. The program provides a mechanism for management to assess the adequacy with which the tank farms and other waste management units such as LERF are being operated and maintained. The central focus of the program is the performance of tours (i.e., general inspections) that examine the following three general operation indicators:

- Material condition - including items such as leaks, equipment lubrication, gages, instrumentation, piping, drains, and lighting
- Cleanliness and housekeeping - including items such as documents and files, change trailer in order, and trash onsite
- Safety - including items such as signs, locks, safety hazards, unsafe work habits, fire hazards, fire protection, and emergency equipment.

The Tank Farms Management Overview Program coordinator is responsible for scheduling overview program tours. These tours are conducted at the LERF on a regular basis in addition to routine inspections. The results of the tours are documented on tour report forms that include the inspector's name and signature, time and date of the tour, observations, action items (including identification of action assignee by name), and response to the action item. The management overview program coordinator maintains a master action item tracking list to identify the status of all action items. The completion of the action items is noted on the tracking list. The tour reports for the LERF and the master action item tracking list are maintained in the 2750-E Building.

6.2.1.2.1.2 Tank Farms Internal Surveillance System. The management overview program established an internal surveillance system within the Tank Farms and associated operations (including LERF) to ensure that the Tank Farms units are complying with the appropriate Tank Farms and other procedures, directives, and documents, and to identify any system deficiencies. The surveillance system provides the following checksheets for use during audits performed under this system:

- Logbook and unusual occurrences
- Tank Farms training records
- Burial records and radioactive shipment records
- Standard operating procedure compliance
- Fire protection
- Configuration control
- Procedure change authorization procedure and logbook
- Stock rooms and storage areas
- Operational safety requirements compliance
- Tank Farms key control

- Tank Farms administrative procedure(s) compliance
- Tank Farms spares analysis report
- Housekeeping procedure review.

In addition to these checksheets, audit findings are documented using an "Internal Surveillance Close Out Report." The checksheets and close out report, and all associated follow-up documentation, are forwarded to the Tank Farms manager and the Tank Farms administrative specialist.

6.2.1.2.1.3 Quality Assurance Audits. Quality Assurance personnel are responsible for the programming, scheduling, and performance of quality assurance audits of internal and external programs and projects. The purpose of the quality assurance audits is to evaluate compliance with quality assurance requirements established for a given activity. The quality assurance audit is independent of both the Tank Farms Management Overview Program and the Tank Farms Internal Surveillance System. A quality assurance audit of the LERF is conducted annually or as otherwise specified by the quality assurance management and other department and/or division management.

6.2.1.2.1.4 Environmental Compliance Verification. Environmental Assurance is responsible for verifying program and waste management unit environmental compliance with regulatory compliance. This responsibility includes the performance of audits, inspections, environmental surveys, and other similar activities. The Environmental Compliance Verification Program is independent of both the Tank Farms Management Overview Program and the Tank Farms Internal Surveillance System.

6.2.2 Specific Process Inspection Requirements [F-2b]

The following sections detail the inspections performed at the LERF.

6.2.2.1 Container Inspection [F-2b(1)]. Normal operation of the LERF does not involve the storage of dangerous waste in containers. Therefore, the inspection requirements of this section normally are not applicable to the LERF. Any containerized RCRA-regulated waste that may be generated at or brought to the LERF will be at the LERF less-than-90 days and will be managed in accordance with WAC 173-303-200(1).

6.2.2.2 Tank Inspection [F-2b(2),(2)a-(2)f]. The LERF employs an extensive piping system. Ecology regulations do not specifically require a discussion of piping for surface impoundments. However, for the purposes of comprehensive coverage of the LERF, this permit application includes a complete description of the piping (Chapter 4.0, Section 4.2) as well as inspection and integrity assessments of the piping system.

Process condensate is transferred to the LERF from the 242-A Evaporator via a buried pipeline. At the LERF dikes, aboveground piping serves to transfer waste to the LERF basins. All of the piping and fittings that are not directly over a catchbasin or a basin liner are of pipe-within-a-pipe construction.

The buried pipeline will be 'inspected' continuously by an electric leak detection system. Single point leak detection elements are installed along the main pipeline at 1,000 foot (305 meter) intervals. Each element of the leak detection system is monitored for active connection to the main alarm line by the leak detection element continuity alarm. This alarm is monitored at the monitor and alarm station at the 242-A Evaporator. Also, because each subsequent leak detection element is downgradient from the previous element, the system is self-monitoring. With the exception of the last element nearest the LERF, any failing element would be noticed because the subsequent element would signal a release. Section 4.2.3 in Chapter 4.0 further describes the leak detection system.

The piping system will undergo ongoing integrity assessments in compliance with WAC 173-303-640(2)(e). Details of the piping layout are provided in Drawings H-2-79608, H-2-79609, H-2-79610, and H-2-79611 in Appendix 4B.

During inspections, the aboveground piping will be inspected visually for signs of leakage and for general structural integrity. During the visual inspection, particular attention will be paid to valves and fittings for signs of cracking, deformation, and leakage.

6.2.2.3 Waste Pile Inspection [F-2b(3),(3)a-(3)d]. Operation of the LERF does not involve the placement of dangerous waste in piles. Therefore, the inspection requirements of this section are not applicable to the LERF.

6.2.2.4 Surface Impoundment Inspection [F-2b(4)]. The inspection program followed by the operators of the LERF was developed to ensure that the LERF is properly maintained and operated, and any problems that might develop are identified and corrected in a timely fashion. Inspections are performed daily when any of the basins contain waste water and after significant precipitation events (Chapter 4.0, Section 4.4.9.11). When the basins are not in use, the LERF is inspected weekly by the operators. As indicated on the LERF inspection schedule, and as discussed in Section 6.2.1.2.1, a number of the LERF system components are inspected at varying frequencies by various organizations. These inspections serve to ensure that the LERF and its components are maintained and operated in accordance with all applicable regulations, U.S. Department of Energy Orders, and operations contractor procedures, directives, and documents.

6.2.2.4.1 Condition Assessment [F-2b(4)(a)]. The following sections describe assessment procedures for the overtopping control system and the sudden changes in basin fluid levels.

6.2.2.4.1.1 Overtopping Control System [F-2b(4)(a)(1)]. Each storage basin is designed and constructed to maintain 5 feet (1.5 meters) of freeboard in addition to an active storage volume of 6.5 million gallons (24.6 million liters), with a fluid depth of 19 feet (5.8 meters). The amount of freeboard is determined through the use of level indicators. The level indicator system consists of calibrated height lines painted on the basin covers. These horizontal lines correspond to the point at which the floating cover bends as it lifts from the waste surface. The calibrated lines provide a visual indication of changes in basin waste levels. The level indicators are checked as part of the daily inspection conducted at the LERF.

The LERF operating records also indicate the volume of process condensate that has been pumped to each basin. Basin waste can be transferred between basins should basin volume adjustment or drainage be necessary. The relatively low rate of flow into the basins [maximum flow of approximately 75 gallons (284 liters) per minute] allows a margin of safety against overtopping. As discussed in Chapter 4.0, Section 4.4.8, it would require over 2 weeks of continuous flow to overtop a basin after the 5 foot (1.5 meter) freeboard level was reached.

The basins also are provided with floating very low-density polyethylene covers that are designed and constructed to prevent the introduction of precipitation into the basins and the buildup of sediments within the basins. The covers also prevent the evaporation of the fluid and reduce the emission of volatile organic constituents into the air. Details of the basin covers are provided on Drawing H-2-79591 in Appendix 4B.

6.2.2.4.1.2 Impoundment Contents [F-2b(4)(a)(2)]. The LERF basins are inspected daily while in use. One of the inspection items is an assessment of whether effluent is escaping a basin. Basic release or escape indicators, should a loss of impoundment contents be occurring, include unaccountable change in the level indicators on the LERF covers, and activation of the leachate collection pump beyond 'normal' periods of time.

Maintenance of at least 5 feet (1.5 meters) of freeboard is assessed through the use of a visual level indicator system. This method also is used to determine whether fluid is being released from the basin. The level indicator system consists of calibrated height lines painted on the basin covers. These horizontal lines correspond to the point at which the floating cover bends as it extends from the waste surface to its anchor points. The calibrated lines provide a visual indication of the basin fluid level. The manual level indicators are checked as part of the daily inspection, and fluid height is recorded on the inspection checklist.

A leak in the primary liner would release process condensate to the underlying drainage gravel. Released fluid would drain to the leachate collection sump. The leachate collection sump pump is activated automatically when the liquid level in the leachate sump reaches 10 inches (25 centimeters). Leachate within the leachate collection sump is pumped directly back to the basin. More frequent than normal operation of the leachate pump could indicate a leak had occurred.

Whether the sump pump is operational is determined by means of a signal from the pump motor starter to the 242-A Evaporator control room, showing at any time whether the pump is on or off. A pump failure will be detected on the control room monitors, or by the LERF inspectors noting that the daily leachate pumping volume has dropped off.

The EPA acknowledges that there could be some 'normal' leakage associated with a properly constructed liner (EPA 1989, p. 121). The LERF operators will determine what 'normal' leakage is for each basin through daily documentation, and charting of leachate volumes pumped, and comparison with calculated anticipated values.

6.2.2.4.2 Structural Integrity [F-2b(4)(b)]. Written certification attesting to the structural integrity of the basin dikes, signed by a qualified, registered professional engineer, is included in Appendix 4C. The engineer reviewed the supporting calculations that were performed to determine static and dynamic loads and stresses as well as material testing data, soil-compaction testing data, and other quality control measures that were followed during the construction of the basins.

Visual inspections of the exterior dike walls are conducted on a regular basis and after significant precipitation events. The purpose of these inspections is to make note of any impacts on the dikes from precipitation events, wind, burrowing mammals, or vegetation, and to implement corrective measures to ensure the structural integrity of the dikes.

6.2.2.5 Incinerator Inspection [F-2b(5),(5)a-(5)b]. Operation of the LERF does not involve the incineration of dangerous waste. Therefore, the inspection requirements of this section are not applicable to the LERF.

6.2.2.6 Landfill Inspection [F-2b(6),(6)a-(6)d]. Operation of the LERF does not involve the placement of dangerous waste in landfills. Therefore, the inspection requirements of this section are not applicable to the LERF.

6.2.2.7 Land Treatment Facility Inspection [F-2b(7),(7)a-(7)b]. Operation of the LERF does not involve the land treatment of dangerous waste. Therefore, the inspection requirements of this section are not applicable to the LERF.

6.3 WAIVER OR DOCUMENTATION OF PREPAREDNESS AND PREVENTION REQUIREMENTS [F-3]

The following sections describe the emergency preparedness and prevention measures taken for the LERF.

6.3.1 Equipment Requirements [F-3a]

The following sections describe the internal and external communications system and the emergency equipment required.

6.3.1.1 Internal Communications [F-3a(1)]. The LERF is an unmanned waste management unit. When operators are present at the LERF, the operators carry mobile (hand-held) two-way radios to maintain contact with Tank Farms supervisory personnel. In addition, the vehicles used by LERF operators are equipped with two-way radios for intraplant communications. The mobile two-way radios are used if the operators become separated.

The operators are informed of emergency situations (e.g., building and/or area evacuations, take-cover events, high airborne contamination, fire, and/or explosion), and are provided with emergency instructions by several systems. These systems include the mobile two-way radios, vehicle two-way radios, and the telephone in the LERF change trailer.

6.3.1.2 External Communications [F-3a(2)]. The LERF and its operators are equipped with devices for summoning emergency assistance from the Hanford Fire Department, the Hazardous Materials Response Team, and/or local emergency response teams, as necessary. External communication is made by either a telephone communication system, the vehicle two-way radios, or mobile two-way radios. The LERF telephone is available in the change trailer. Personnel assigned to emergency response organizations are reached in the following ways:

- Telephone number 811--contact point for the Hanford Site; on notification, the Hanford Patrol Operations Center notifies and/or dispatches required emergency responders
- Telephone number 3-3800--single point of contact for the emergency duty officer; this number can be dialed from any Hanford Site telephone
- Two-way radio system--consists of hand-held or vehicle radios; the system accesses the Hanford Site emergency network and can summon the Hanford Fire Department, Hanford Patrol, and/or any other assistance requested to handle emergencies.

6.3.1.3 Emergency Equipment [F-3a(3)]. Spill control equipment, decontamination equipment, personal protection equipment, and a fire extinguisher are available at the LERF change trailer to respond to minor emergencies. The LERF relies primarily on the Hanford Fire Department to respond to fires and other emergencies. The Hanford Fire Department is capable of providing rapid response (less than 10 minutes) to fires within the 200 East Area. A list of the emergency equipment available at the LERF is provided in Appendix 7A. All LERF operators are familiar with the LERF contingency plan and trained in the use of emergency pumping, fire, and communications equipment. The Hanford Site maintains a sufficient inventory of heavy equipment (e.g., bulldozers, cranes, roadgraders) that could be used at the LERF to provide emergency repairs and/or containment if a dike or piping failure occurred.

6.3.1.4 Water for Fire Control [F-3a(4)]. A water main is not provided to the LERF. Water for fire control is supplied by the Hanford Fire Department trucks for fires requiring high water volume and pressure. Water is supplied by the following equipment:

- Each fire station normally has a truck equipped with a hydraulically operated aerial ladder, and one pumper (backup fire engine, without a boom, that is used if the aerial ladder is inoperable). Fire engines have a pumping capacity of at least 1,500 gallons (5,678 liters) of water per minute.

- Other fire protection equipment uses chemicals rather than water as an extinguishing media.

The closest fire hydrant to the LERF is located on 8th Street, approximately 1,000 feet (305 meters) southwest of the southwest corner of the LERF.

6.3.2 Aisle Space Requirement [F-3b]

The operation of the LERF does not involve aisle space because liquid waste is stored in four storage basins. Nevertheless, the LERF and the individual basins are easily accessible to emergency response personnel and vehicles. A 20-foot- (6.1-meter-) wide service road runs along the base of the basin area on the east, south, and west sides within the operational security fence. The LERF area roads are shown on Drawing H-2-81750 in Appendix 2A.

6.4 PREVENTIVE PROCEDURES, STRUCTURES, AND EQUIPMENT [F-4]

The following sections describe preventive procedures, structures, and equipment.

6.4.1 Unloading Operations [F-4a]

Waste at the LERF is not physically handled by the LERF operators. Waste is conveyed by a transfer pipeline from the 242-A Evaporator to any of the four basins and discharged directly into the basin of choice. The pipeline is a fiberglass-reinforced epoxy double-wall pipe approximately 4,950 feet (1,509 meters) long. The transfer line encasement is equipped with an electronic leak detection system. If a leak is detected in the 242-A Evaporator transfer line, the process condensate pump (PC-100) at the 242-A Evaporator is shut off automatically or the process condensate stream is directed to a holding tank. To drain a retention basin, portable submersible pumps (Drawing H-2-79620, sheet 3, in Appendix 4B) are lowered into the four basin risers located at the northwest corner of a basin. After the pumps are installed, the portable manifold assembly (Drawing H-2-79619 in Appendix 4B) is connected. Valves are closed or opened depending on the direction of the fluid transfer. Pumps are started, providing maximum flow of 700 gallons (2,649.5 liters) per minute into another basin.

6.4.2 Run-Off/Run-On [F-4b]

The LERF is constructed and operated to ensure that all waste is contained within the basins. All piping and fittings not directly over the basins are of pipe-within-a-pipe construction. The basins are designed and operated to maintain a minimum freeboard of 5 feet (1.5 meters). Overtopping controls are discussed in Section 6.2.2.4.1.1. Furthermore, the basins are provided with very low-density polyethylene floating covers to prevent the introduction of precipitation into the basins. Precipitation that collects on the basin covers readily evaporates. The basins also are graded to ensure that all precipitation outside the basins is directed away from the surface impoundments.

The basins are constructed so that the top of the basin dikes are approximately 10 feet (3 meters) abovegrade. The exterior side slopes of the basins have a 2.25 (horizontal) to 1 (vertical) slope. Run-on of precipitation to the basins from the surrounding area is not possible because the surrounding area slopes away from the LERF. Drawing H-2-79583, sheet 3, in Appendix 4B provides grading and topographic details.

6.4.3 Water Supplies [F-4c]

The LERF uses procedures, structures, and equipment to prevent the contamination of natural water supplies (i.e., groundwater and surface water). The LERF is monitored closely during operation to detect abnormal conditions (e.g., leaks), and regularly inspected to detect equipment and structural deteriorations that could allow possible water supply contamination. Secondary containment is provided to all piping associated with the LERF, and the basins are provided with a leachate collection system that is designed to contain any leachate generated. These systems, in conjunction with the double-composite liner system and underlying low permeable clay liner, ensure that should a release occur, the release will be fully contained within the basin configuration and, therefore, water supplies will be protected. Appendix 7A provides information on procedures that are implemented at the LERF if a release is detected.

6.4.4 Equipment and Power Failure [F-4d)

A portable generator located in the 200 East Area can be used if needed in the event of a power outage. The storage function of the LERF is not affected by loss of power. Should a power or equipment failure occur at the 242-A Evaporator, appropriate valving procedures are followed to ensure a smooth restart of the flow to the LERF. Pump equipment failure is addressed by operations personnel at the 242-A Evaporator.

6.4.5 Personnel Protection Equipment [F-4e]

At the LERF, procedures, structures, and equipment are used to prevent undue exposure of personnel to mixed waste. Protective clothing and equipment are used by all personnel handling dangerous waste. All operations are conducted so that employee exposure to dangerous waste, hazardous, and radioactive materials are maintained as low as reasonably achievable (ALARA). Personnel protection begins with protective clothing. A change trailer (Chapter 2.0, Section 2.1.2.6) exists near the entrance to the LERF. The change trailer provides change areas for men and women. Both clean and special work procedure clothing change areas are available. In addition, the change trailer has an operations office (for working procedures and records), both clean and soiled clothing storage areas, a mechanical room, and a vestibule with portal monitors. The portal monitors are located between the clean change room and the special work procedure change room and measure total beta and gamma radiation. Exits within the change trailer are clearly marked (Rieck 1990, pp 11,12).

A fenced special work procedure control area is located between the change trailer and the step-off pad at the exit from the basin area. This concrete pad also has bins for used special work procedure clothing. The LERF storage building also is provided with separate storage areas for clean and contaminated equipment (Rieck 1990, pp. 11,12). A decontamination shower and decontamination building is located at the 272-AW Building, approximately 1 mile (1.6 kilometers) from the LERF.

Protective clothing and equipment are prescribed for personnel handling chemicals or dangerous waste. Before the start of any operation that could expose employees to the risk of injury or illness, a review of the operation is performed to ensure that the nature of hazards that might be encountered is considered and appropriate protective gear is selected. Employees are instructed to wear personal protective equipment in accordance with training, posting, and instructions.

6.5 PREVENTION OF REACTION OF IGNITABLE, REACTIVE, AND INCOMPATIBLE WASTES [F-5]

There is no ignitable or reactive waste stored at the LERF. However, as a standard precaution (rationale given in Section 6.1.1.3), no smoking is permitted at the LERF and "No Smoking" signs are posted around the unit.

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APPENDIX

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7.0 CONTINGENCY PLAN [G]

The WAC 173-303 requirements for contingency plans are satisfied in the following documents: the DOE-RL emergency plan and procedures manuals, the *Westinghouse Hanford Company Emergency Plan* (WHC 1989), and the *Westinghouse Hanford Company Building Emergency Plan 200 Area Tank Farms* (Appendix I pertains to the LERF). The DOE-RL emergency plan and procedures manuals and the *Westinghouse Hanford Company Emergency Plan* are available for review upon request. The building emergency plan for the LERF was prepared before initial operation of the unit and will be revised after plant operating parameters are established. The building emergency plan for the LERF is included as Appendix 7A.

The cited contingency plan documents also serve to satisfy a broad range of other requirements (e.g., Occupational Safety and Health Administration and U.S. Department of Energy Orders). Therefore, revisions made to portions of the contingency plan documents that are not governed by the requirements of WAC 173-303 will not be considered as a modification subject to review or approval by Ecology.

APPENDIX 7A

WESTINGHOUSE HANFORD COMPANY BUILDING EMERGENCY PLAN FOR THE LIQUID EFFLUENT RETENTION FACILITY

APPENDIX 7A

This appendix contains the *Westinghouse Hanford Company Building Emergency Plan 200 Area Tank Farms*. Appendix I of this building emergency plan is specific for the LERF.

APPENDIX I

BUILDING EMERGENCY PLAN FOR THE LIQUID EFFLUENT RETENTION FACILITY

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LIST OF FIGURES

I1.0 INTRODUCTION

The Liquid Effluent Retention Facility (LERF) Emergency Plan has been designed to provide a system of planned responses that will minimize risks to personnel, equipment, buildings, and the environment in an emergency situation. This plan is applicable to the employees and visitors associated with the LERF.

I1.1 FACILITY NAME: U.S. Department of Energy (DOE), Hanford Site Liquid Effluent Retention Facility.

I1.2 FACILITY LOCATION: Benton County, Washington; northeast of the Hanford Site 200 East Area.

Facilities covered by this plan are the LERF and adjacent roads, berms, and access.

I1.3 OWNER:

U.S. Department of Energy
Richland Operations Federal Building
825 Jadwin Avenue
Richland, Washington

CO-OPERATOR:

Westinghouse Hanford Company
P.O. Box 1970
Richland, Washington

I1.4 DESCRIPTION OF THE FACILITY AND OPERATIONS

The facility consists of three, 6.5 Mgal basins that store the 242-A Evaporator process condensate until permanent treatment and disposal are complete.

The LERF is located on the Hanford Site in the 200 East Area. Within the 200 East Area, the LERF is located approximately 3/4 mile north of the 242-A Evaporator and approximately 1 mile north of the PUREX plant. General site plan maps of the Hanford Site and the LERF are provided in Figures 1-1, 1-2, and 1-3. The basins are constructed on highly compacted soil. Each basin consists of an inner primary and an outer secondary high-density polyethylene (HDPE) liner separated with a geotextile drainage media, supported by metal walls and structural support. The drainage media will interconnect with a leak detection system consisting of a standpipe system with level measurement and sampling capability.

Supporting the LERF is approximately 4,950 feet of underground transfer piping, provided with outer encasement. The monitoring consists of electronic leak detection at 1,000-foot intervals and at all low points and drains, and swab risers for visual leak detection located every 100 feet.

The LERF will include a change trailer, a step-off pad area, and small metal storage building.

I1.5 FACILITY EVACUATION ROUTING (FACILITY LAYOUT)

In a major spill or catastrophic basin failure, personnel near this facility should evacuate to higher ground and exit the facility. Move all motor vehicles out of the facility if not contaminated by the spilled contents. See Figure I1.

After evacuating the facility, personnel should move west along the access road to avoid potentially contaminated wind plumes. Vehicles outside the facility and uncontaminated by the spill should be moved to the west along the access road. See Figure I1.

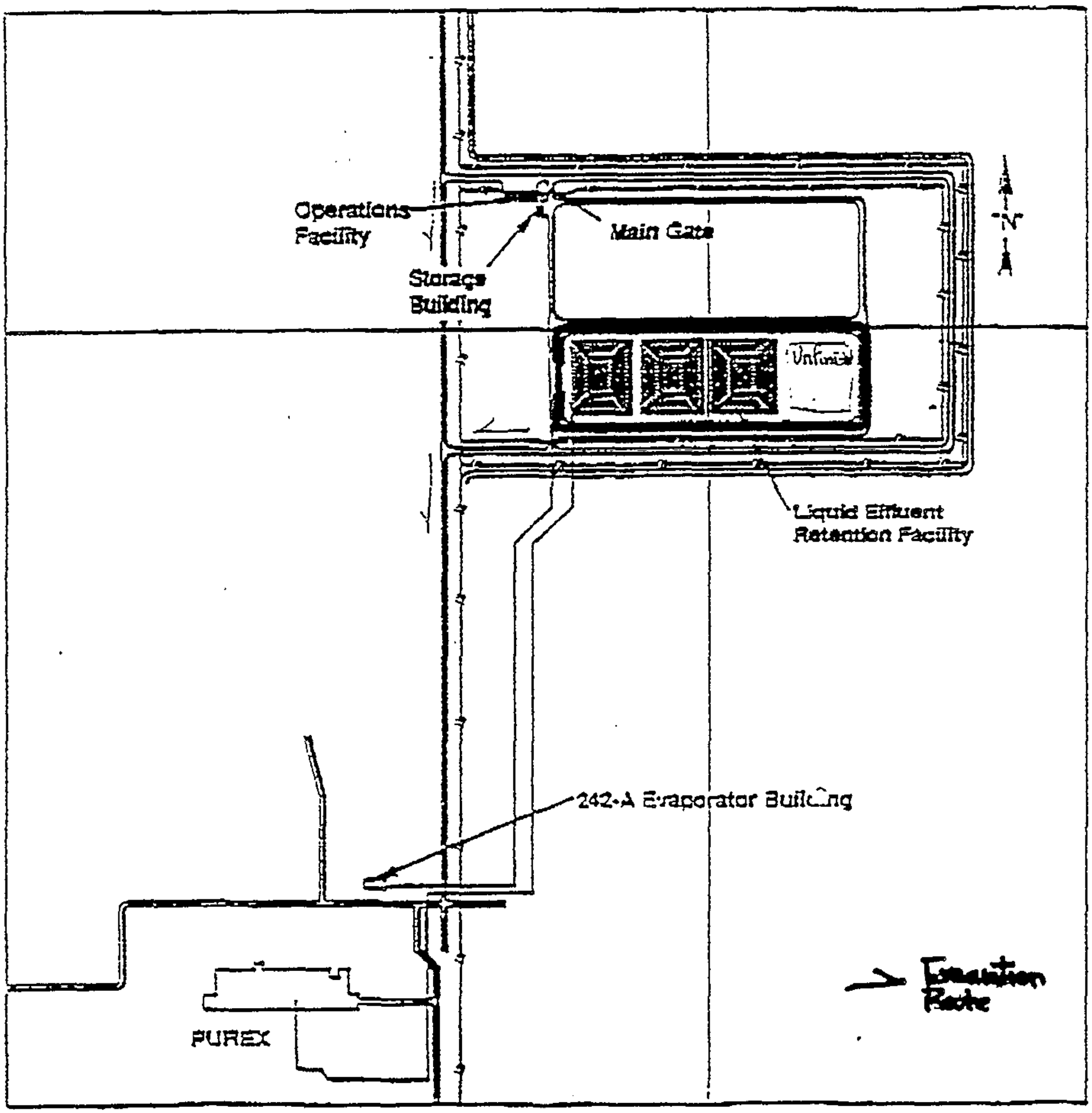
I2.0 PURPOSE

I2.1 PURPOSE OF PLAN

The LERF Emergency Plan provides employees and visitors with the information necessary to react in emergency situations to accomplish the following:

1. Maximize employee safety, minimize the risk to life, and provide prompt and efficient treatment for injured persons.
2. Ensure continuity of leadership at all times and in all emergency situations.
3. Minimize the effects of an accident on the health and safety of the general public and the environment.
4. Minimize property damage.
5. Ensure prompt internal and external communications with responsible authority.
6. Meet the requirements of DOE Orders 5500.3 series.
7. This plan complies with the requirements of WHC-CM-4-1, *WHC Emergency Plan*. The emergency plan for this facility is comprised of this plan, the *WHC Emergency Plan*, the U.S. Department of Energy-Richland Operations Office (DOE-RL) Emergency Plan, and the DOE-RL Emergency Procedures Manual.

Figure I1. Liquid Effluent Retention Facility Location & Evacuation Routes.



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I2.2 EMPLOYEE REQUIREMENTS

Each WHC employee working at this facility is required to annually review this plan and document that review by using the Employee Building Emergency Plan Checklist (Form A 6000-214) as defined in WHC-CM-4-1.

Refer to Section 2.0 of the Tank Farms Emergency Plan (WHC-CM-0263-TF) for the responsibilities and notification.

I3.0 POTENTIAL EMERGENCY CONDITIONS

The following provides a generalized idea of the types and amounts of hazardous materials stored at the facility. Job safety analysis and radiation work procedures provide the basis for safe use of the materials in the work place. Employees associated with LERF shall be trained in the appropriate actions to take in case of a spill or unwanted release.

I3.1 EVACUATION AND TAKE COVER

Evacuation at this facility may be required for a general site evacuation or a major breach of containment at the facility itself.

I3.2 OPERATIONAL EMERGENCIES

The following emergency situations are those considered credible for this facility, unless determined to be not applicable (NA). Described are the types and extents of credible emergency events. The response plan for each type is listed in Section I6.0 of this plan.

I3.2.1 Bomb Threat

The likelihood of a bomb threat at this facility is remote since the result would be of such low consequence to a potential bomber. A bomb could, however, cause failure of the basins with the possible release of low-level hazardous or radioactive contaminants to the environment, personal injury, and equipment damage.

I3.2.2 Industrial Accidents

There is not a serious potential for industrial accidents at the facility. Hazards associated with industrial accidents include release of low-level hazardous and radioactive contaminants to the environment, human injury, and equipment damage.

I3.2.3 Loss of Electricity

The loss of electricity at this facility would disable the monitoring systems (liquid level), the storage building fan, and the permanent leachate pumps.

I3.2.4 Loss of Water

NA. Water utilities are not provided for this facility.

I3.2.5 Loss of Ventilation

There is no active ventilation system for the process condensate stored at the LERF. A ventilation fan operates within the storage building. A loss of this fan could cause a buildup of vapors within the building.

I3.2.6 Loss of Steam

NA. Steam is not provided for this facility.

I3.2.7 Loss of Air

NA. Air is not provided.

I3.2.8 Fire

The hazards associated with a fire include human injury, equipment loss, and, depending on the severity, loss of containment. Because the transfer pumps and permanent leachate pumps are powered by gasoline, a fire involving gasoline is conceivable. This fire is not anticipated to cause loss of containment, but a remote possibility exists if the fire went out-of-control. The worst-case fire is postulated to result from gasoline vapors igniting with an unidentified ignition source.

I3.2.9 Major Process Upset

A major process upset could result in the loss of containment or the release of hazardous substances to the environment. The worst-case process upset is the overfilling of a basin from the process condensate line of the 242-A Evaporator. However, the probability of such an occurrence is remote because of the 5 foot freeboard required.

I3.2.10 Pressure Hazards

There is little likelihood of pressurized systems at the facility becoming a hazard. Systems under pressure include the basins themselves, from 0-20 ft of hydrostatic head, any external loading such as snow, and the intertank pumping system. The worst-case pressure accident would be a breached or leaking transfer line during transfer operations resulting in a possible discharge to the environment. The probability of this occurrence is remote because the discharge pressure will be near atmospheric and no line restrictions should occur.

I3.2.11 Security Event

Same as a bomb threat described in Section I3.2.1.

I3.3 NATURAL HAZARDS EMERGENCIES

The following emergencies are those applicable to facilities on the Hanford Site. A response plan for each is in Section H6.0.

I3.3.1 Seismic Event

A seismic event could result in the loss of containment of the LERF basins with a possible discharge of hazardous contaminants to the environment resulting in equipment damage.

I3.3.2 Volcanic Eruption and Ashfall

Minimal potential for volcanic hazards exist for the facility. The event would have to occur in the immediate vicinity. The area is not volcanically active.

I3.3.3 High Winds or Tornado

High winds or tornado could result in spills and loss of containment at the facility resulting in the possible discharge of hazardous contaminants to the environment, personal injury, and equipment damage. The worst-case event involving winds or tornado is postulated to be the failure of a retaining wall of a filled basin.

I3.3.4 Flood

NA. The 200 Area is situated on a plateau with a higher elevation than the calculated probable maximum flood. Therefore, a flood is not considered a credible event.

I3.3.5 Range Fire

A range fire should not present any hazard to the facility because the facility is designed with fire breaks, and minimal flammable material is used in the construction. The HDPE liners are flammable but are unlikely to burn, so no loss of containment is expected as a result of a range fire. Gasoline used to power the intertank transfer pump is combustible and could ignite during a range fire resulting in possible injury to humans and damage to equipment. Loss of containment because of a range fire is not considered probable.

I3.4 HAZARDOUS MATERIALS AND MIXED WASTE SPILLS AND RELEASES

This section addresses the spill or release of nonradioactive hazardous materials, as well as mixed waste (radioactively contaminated hazardous materials). The term hazardous material, as used here, means both nonradioactive and mixed waste. The stored process condensate contains low concentrations of several species of inorganic and organic contaminants normally less than maximum contamination level (MCL) concentrations.

Hazardous materials can be stored and used throughout the facility (the process condensate has the potential to contain hazardous contaminants).

The use, storage, and control of hazardous and industrial materials are controlled by plant operating procedures, which are located at the 272-AW Building in the 200 East Area. Spills or releases could result in the conditions described in the following subsections.

I3.4.1 Spill of Hazardous Material

The spill of a hazardous material, i.e., a spill from the LERF, could result in the discharge of a hazardous material in concentrations exceeding established limits.

I3.4.2 Fires or Explosions Involving Hazardous Material

Fires or explosions involving hazardous material could result in the loss of containment with the discharge of a hazardous material exceeding established limits.

Fires or explosions involving hazardous material are extremely unlikely. Near zero probability exists for fires or explosions from the process condensate stored in the basins. The probability of a fire or explosion involving gas, oil, or industrial fluids is possible, but unlikely, since there are no ignition sources or oxidizing chemicals.

I3.4.3 Toxic Fumes Hazards

NA.

I3.4.4 Reactive Chemical and Corrosive Material Hazards

NA.

I3.4.5 Thermal Reactions and Hazards

NA.

I3.4.6 Flammable Material and Liquids Hazards

The gasoline used to power the pumps could ignite if handled in an unsafe manner. The worst-case accident is postulated as ignition of gasoline fumes resulting in a small fire. Property damage and personal injury could occur as a result, but loss of containment is not probable.

I3.4.7 Asbestos Release

NA.

I3.5 RADIOACTIVE MATERIALS

Radioactive materials are expected to be stored in the LERF basins or other areas of the facility. Low-level radioactive contaminants are present in the LERF. Described in the following subsections are the credible types and extents of emergency situations, unless identified as NA. The response plan for each type of emergency is listed in Section I6.0 of this plan.

I3.5.1 Gaseous Effluent Discharges (Stack Releases)

NA.

I3.5.2 Liquid Effluent Discharges

NA. There are no normal effluent discharges from this facility. A liquid discharge from a LERF basin would constitute a breach of containment.

I3.5.3 Significant Contamination Spread or Releases

Contamination spread could result in skin contamination and discharge to the environment in excess of established limits. The worst-case contamination spread is postulated to result from a complete loss of containment of one or more of the basins while radioactive contaminants exceeding the established limits are being stored.

I3.6 CRITICALITY

NA.

I3.7 EXPLOSIVE MATERIALS AND MUNITIONS HAZARDS

NA.

I4.0 IMPLEMENTATION OF BUILDING EMERGENCY PLAN

I4.1 IMPLEMENTATION

The emergency plan will be implemented when the BED, emergency coordinator, or alternate determines that the severity of an incident potentially endangers human health or the environment. The plan will be implemented whenever there is an imminent threat or an actual incident, as listed in Section I3.0. Implementation of this plan invokes the reporting requirements of Washington (State) Administrative Code (WAC) Chapter 173-303, *Dangerous Waste Regulations*.

The BED is responsible for assessing facility emergency incidents. The BED will determine the level of action necessary to protect the personnel, facility, and the environment. The BED will be located at the facility and will establish the Incident Command Port (ICP). The Emergency Call list contains the names of BEDs and alternates. First-line management present at the facility qualify as emergency coordinators in accordance with Section 2.4.1.1 of this BED. They will assume applicable responsibilities as alternate BEDs and be assigned as emergency coordinators or alternates as shown in the Emergency Call list.

If the incident requires assistance from patrol, fire, or ambulance units, notification will be made by calling the Hanford Emergency Response number (811). Personnel operating the facility will not have access to a telephone and must relay this information via a two-way radio.

When additional resources or assistance from outside the facility other than from patrol, fire, or ambulance units is required, notification is given to the Emergency Duty Officer at the Patrol Operations Center (POC) (373-3800). For a relatively minor incident, the situation will be handled by facility personnel under the direction of the BED and line management.

I4.2 IDENTIFICATION OF HAZARDOUS MATERIALS

Refer to Section 4.2 of this emergency plan.

I4.3 EMERGENCY DOSE LIMITS

Radioactive contaminants in excess of the established limits are not expected to be present at the facility. If the radioactive contaminants exceed the limits that have been established and the dose limits need to be exceeded to perform an emergency action, personnel will follow the guidelines in WHC-CM-4-1, in conjunction with the Emergency Response Organization response plan.

I5.0 EMERGENCY RESOURCES

I5.1 BUILDING EMERGENCY ORGANIZATION

For the LERF, the Emergency Call List will be maintained and updated weekly by Operations and will be inserted into the front of Tank Farm Emergency Plans located at each of the Tank Farm Facilities. In an emergency that requires implementation of the provisions of this plan, the person acting as the BED has the authority to commit the resources required to respond, including money, manpower, or equipment.

Definitions of roles and responsibilities are contained in the WHC-CM-4-1.

I5.2 IDENTIFICATION AND DESCRIPTION OF EMERGENCY EQUIPMENT

The LERF has emergency equipment as summarized below.

Fixed Emergency Equipment

None.

Portable Emergency Equipment

Type	Location	Capabilities
Fire extinguisher	Metal building & Trailer	Use on any Class A, B, and C fires. (Note: Some are only Class B and C).
Eyewash station	Trailer	First aid eyewash

Fire Classification Examples

Class A	wood, cloth, paper
Class B	flammable liquids, gases, greases
Class C	energized electrical equipment
Class D	combustible metals, sodium, lithium

Protective Equipment

Type	Location	Capabilities
Rubber gloves	272-AW Building	Emergency protective gear
Face shield	272-AW Building	Emergency protective gear
Protective rain clothing	272-AW Building	Emergency protective gear

Spill Control Equipment*

Type	Location	Capabilities
Absorbent	Metal building	Minor spills
Shovel and barrel	Metal building	Minor spills

*To be used for nonradioactive hazardous materials during an emergency or recovery phase.

Emergency Monitoring Kit

Type	Location	Capabilities
Emergency monitoring kit	HPT Office (MO-386) or call 3-2526	Use during emergencies to provide radiation detection equipment (two 100R/min high rate dose meters, two 0-10R self-reading pencils, two 0-50R self-reading pencils, two 0-600R self-reading pencils), SWP clothing, and respiratory equipment.

I5.3 EMERGENCY NOTIFICATIONS

The retention basins are unmanned except during transfer, inspection, or sampling operations. At these times, personnel involved in these operations are in contact with Tank Farms supervisory personnel via mobile hand-held radios, 2-way radios carried in all vehicles, and via the telephone located in the LERF change trailer. Primary notification of emergency events is transmitted to personnel involved in LERF operations via one or all of these means. For any emergency incident in a safe area, relay information via the two-way radio or telephone to the Tank Farms Shift Office Manager. Refer to Section 5.3.2 of the TFEP.

I5.4 ACTIVATION OF EMERGENCY ALARMS

The LERF does not have any facility specific emergency alarms. It is within hearing distance of the 242-A Evaporator and the PUREX Plant, and Site-wide emergency signals can be heard by operating personnel working at the LERF. For the tank farm standard emergency alarms, refer to Section 5.4 of this BEP.

I6.0 EMERGENCY RESPONSE PLANS

This section contains emergency response guides that pertain to the LERF.

I6.0.1 Assessment

After identifying the source and nature of the incident, the BED, emergency coordinator, or alternate will assess any potential hazards to human health or the environment by using the following criteria:

- Origin of the leak, fire, or explosion, if known
- Conditions of the source; e.g., controllable leak or fire, uncontrollable leak or fire, easily moved, immovable
- Materials involved
- Physical state of the material; e.g., solid, liquid, or gas
- Evidence of reaction(s); e.g., fuming, flaming, gas evolution
- Odor
- Color of material.

This information, in conjunction with the detailed information acquired in determining the material involved, will provide the BED, or person assessing the event, with enough data to assess potential hazards and to determine the appropriate response actions necessary.

The assessment will consider the potential for the following:

1. Spread of fire
2. Explosion or further chemical reaction
3. Increase in spill volume
4. Generation of new compounds and their hazards

5. Generation or spread of toxic, irritating, or asphyxiating gases
6. Identification of exposure and/or release pathways
7. Effect of exposure and appropriate safety precautions
8. Contaminated runoff from spilled chemicals, response chemicals and/or fire, explosion, or reaction residues
9. Impacts beyond the immediate area involved.

I6.0.2 Sampling

In cases involving soil contamination, sampling must be performed to determine the lateral and vertical extent of contamination. The BED is responsible for coordinating onsite characterization activities that will be performed by Hanford Site organizations that are qualified to conduct the work. Sampling and testing methods will be in accordance with WAC 173-303-110, "Sampling and Testing Methods," and WAC 173-303-145, "Spills and Discharges into the Environment."

1. The BED takes steps to isolate the area and stabilize the soil surface to prevent the spread of contamination by wind or rain runoff, if necessary.
2. The BED determines, with the assistance of the Emergency Response Organization, the level of protective equipment required to protect workers from the types of hazards to be encountered.
3. Representative soil samples are collected using the appropriate sampling equipment. Sampling is conducted in accordance with sampling and testing methods specified in WAC 173-303-110 and SW-846, *Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods*. An appropriate number of background and blank samples should be collected to aid in data analysis. If contamination is not easily detectable visually or with the appropriate detection instruments, this step may need to be repeated until the full extent of lateral and vertical contamination is known.
4. Samples are transported to and analyzed by an analytical laboratory in accordance with methods specified in WAC 173-303-110 and SW-846.
5. After the extent of soil contamination is quantified, an appropriate method for removal or permanent stabilization of the contaminated soil is determined.

I6.1 RESPONSE TO BUILDING EVACUATION AND TAKE COVER ALARMS

There are no alarms at the facility. Evacuation and take cover action will be initiated by first line management or senior members of the operating personnel.

I6.1.1 Evacuation--Steady Siren Response

When evacuating, employees shall proceed to the primary or alternate staging area as identified below.

Area	Location
Primary Staging Area	Return to 272-AW
Alternate Staging Area	As determined by the BED or delegate.

I6.1.2 Take Cover--Wailing Siren Response

Personnel should take cover in the trailer, the metal building or follow instructions relayed over the two-way radio, by line managers.

I6.1.3 Attack by Hostile Factions--Take Cover

Actions at the facility are at the direction of the BED or delegate. All employees should be familiar with the evacuation process.

The order to evacuate will normally be passed via the two-way radio for the PMSF. Follow the instructions given by the BED or delegate.

I6.2 BOMB THREAT RESPONSE GUIDES

A bomb search kit containing some or all of the following items is located at 272-AW Building storeroom.

- Flashlights
- Bump hats and gloves
- Set of maps
- Marking pens (for marking up search plans on maps)
- Mirrors and extension handles
- Crescent wrenches (for mirror adjustments)
- Thread or string (for marking paths to objects for investigation)

- Green tape (for repairs, holding string, etc.)
- Masking tape (for taping off areas searched).

I6.2.1 Discoverer of a Bomb or Suspicious Object

Discoverers of a bomb or suspicious object should respond as described below.

1. Clear the immediate area of personnel. Do not transmit on a radio near the suspected object.
2. Make sure you are at least 200 ft from the suspected object and then immediately notify the Tank Farms Shift Office Manager via the two-way radio. Instruct the receiver to dial the POC on 811 and to contact the BED. Have the receiver provide the POC and BED with the information that there has been a bomb or suspicious object discovered.
3. Stand guard in a sheltered location at a maximum possible distance to ensure that no one enters the area.

I6.2.2 Bomb Threat Response

With bomb threat, two types of evacuations may be ordered by the BED. The first is the Immediate evacuation procedure which is the same as when the steady siren is activated. The second type of evacuation is the Systematic evacuation, which requires a brief search by all employees of their work area. The WHC Emergency Organization will inform employees of the type of evacuation through a variety of means (i.e., management, crash alarms, public address [PA] announcements, or evacuation sirens).

I6.3 OPERATIONAL EMERGENCY RESPONSE PLAN

The following sections contain response plans for each type of emergency condition or hazard identified in Section I3.0.

I6.3.1 Utility Disconnect Plan

NA.

I6.3.2 Industrial

Industrial accidents at the LERF can be complicated by the potential presence of dangerous wastes and low-level radioactive material that may cause contamination. The avoidance of breaching containment of the basins is extremely important.

The following actions are the responsibility of the BED, or alternate, and should be taken if an industrial accident at the LERF should occur.

1. Personnel discovering or involved with the accident shall notify the BED via relayed message over two-way radio.

2. Call 811 and request emergency support if any injuries occurred. Provide immediate first aid.

3. Confer with Health Physics for contamination controls and area postings if any radioactive contamination was involved.

4. Assign a person to meet the emergency team and direct them to the location of the accident where an injury occurred.

5. Proceed to the scene of the incident and make an assessment of the situation; request assistance if necessary.

6. The Fire Department Hazardous Material Response (HAZMAT) Team, if required, will proceed to the scene of the incident and, coordinating with the BED, initiate actions to control the incident if loss of containment has occurred.

7. Establish an incident command post in a safe location and request additional assistance as necessary.

8. Remove injured personnel to a safe area, provide immediate first aid, and prepare for transport to a full-service medical facility for medical treatment.

9. Establish roadblocks, as necessary, to prevent unauthorized personnel from entering.

10. Isolate and stabilize any hazardous materials until they can be removed in a nonemergency mode and properly treated or disposed. Implement the spill response plan in Section I6.5.1 for any spills, leaks, or discharges of hazardous materials.

11. Clean and repair emergency equipment and return to a condition fit for reuse.

12. Replace all expendable supplies.

I6.3.3 Loss of Electricity

Power is required for the permanent leachate pumps and portable transfer pumps at the basins. Electrical power is supplied from the 13.8 kV 200 East Area distribution line, which is extended to the 500kVA unit sustation located immediately south of the change trailer.

A 15 kVA mini-power center is mounted near motor starters. These provide 208-V power for heat tracing of above-ground piping, 120-V power for instrumentation, and 120-V power for platform or pump pit lighting and convenience receptacles. A 75-kVA transformer is mounted near the change trailer and storage building to provide 208/120-V electrical power for lighting, heating, and cooling in those buildings.

The immediate actions to be taken in case of an emergency power outage at the LERF are:

- Notify supervision and a Health Physics Technologist
- Because of a loss of ventilation in the storage building, a Health Physics Technologist will evaluate air conditions in the building.
- Notify nuclear process operators in the 242-A Evaporator that the LERF pumps and instrumentation are not working. Cease all transfer operations until power is restored.
- If instructed by supervision, evacuate the storage building and close all doors.
- Maintain surveillance of the storage building to prevent unauthorized personnel entry.
- Do not reenter the storage building until the electrical/ventilation systems have been reestablished and operating for at least 30 minutes.

I6.3.4 Loss of Water

NA. There is no water supplied to this facility.

I6.3.5 Loss of Ventilation

NA. A ventilation fan operates within the supply building at the LERF. Loss of this fan would not constitute an emergency situation. However, if hazardous materials are present within the building, it should not be entered until the air within has been sniffed and has been approved.

I6.3.6 Loss of Steam

NA. Steam is not supplied to this facility.

I6.3.7 Loss of Air

NA. Air is not supplied to this facility.

I6.3.8 Fire

Fire fighting at the LERF can be complicated by the potential presence of dangerous wastes and low-level radioactive material that could cause contamination. The avoidance of breaching containment of the tanks is extremely important.

The following actions are the responsibility of the BED, emergency coordinator, or alternate, and should be taken when a fire is detected or an explosion occurs at the LERF.

1. Personnel discovering the fire shall notify the BED via relayed message over two-way radio.

2. Call 811 and request Fire Department support.

3. Confer with Health Physics for contamination controls and area postings.

4. Assign a person to meet the Fire Department and direct them to the location of the fire.

5. Proceed to the scene of the incident and make an assessment of the situation; request assistance if necessary.

6. Facility occupants should attempt to extinguish the fire with the portable fire extinguisher.

7. The Fire Department HAZMAT Team will proceed to the scene of the incident and, coordinating with the BED, initiate actions to control the incident.

8. Establish an incident command post in a safe location and request additional assistance as necessary.

9. Remove injured personnel to a safe area, provide immediate first aid, and prepare for transport to a full-service medical facility for medical treatment.

10. Establish roadblocks, as necessary, to prevent unauthorized personnel from entering.

11. After the fire has been controlled and extinguished, or the cause of the explosion has been eliminated and there is no longer an imminent threat to human health, the BED will announce an "all clear" signal.

12. Isolate and stabilize any hazardous materials until they can be removed in a nonemergency mode and properly treated or disposed.

Implement the spill response plan in Section I6.5.1 for any spills, leaks, or discharges of hazardous materials.

13. Clean and repair emergency equipment and return to a condition fit for reuse.

14. Replace all expendable supplies.

I6.3.9 Major Process Disruption

The process condensate transfer piping system is provided with an electronic leak detection system that is monitored at the 242-A Evaporator control room. Similarly, the basin's automatic leachate detection, collection, and removal system is monitored in the 242-A Evaporator control room where alarms activated by leaks can be responded to quickly. The PC-100 pump, located at the 242-A Evaporator, is interlocked to the leak detection elements, and is configured for automatic shutdown of the waste feed upon leak detection. For leaks detected by visual observation of the swab risers or the basin level indicators, LERF employees will notify nuclear operators in the 242-A Evaporator to initiate shutdown as necessary by radio or telephone communication.

If the manual level indicators indicate that the impoundment basins have less than the required 5 feet of freeboard, the operators in the 242-A Evaporator control room will divert the process condensate stream to another basin via the remotely controlled valve system. The relatively low rate of flow into the basins (maximum flow of approximately 75 gallons per minute) also allows a margin of safety. As discussed in Section 4.4.8, it would require over 2 weeks of continuous flow to overtop a basin after the freeboard level had been reached. Process disruptions at the LERF can be complicated by the potential presence of dangerous wastes and low-level radioactive material that could cause contamination. The avoidance of breaching containment of the basins is extremely important.

The following actions are the responsibility of the BED, or alternate, and should be taken when a process disruption at the LERF occurs.

1. Personnel involved with the process disruption shall notify the BED via relayed message over two-way radio.

2. Confer with Health Physics for contamination controls and area postings if any radioactive contamination was involved.

3. Proceed to the scene of the incident and make an assessment of the situation; request assistance if necessary by contacting 811 via two-way radio.

4. The Fire Department HAZMAT Team will, if necessary, proceed to the scene of the incident and, coordinating with the BED, initiate actions to control the incident.

5. Establish an incident command post in a safe location and request additional assistance as necessary.

6. Remove injured personnel to a safe area, provide immediate first aid, and prepare for transport to a full-service medical facility for medical treatment.

7. Establish roadblocks, as necessary, to prevent unauthorized personnel from entering.

8. Isolate any hazardous materials and stabilize them until they can be removed in a nonemergency mode and properly treated or disposed. Implement the spill response plan in Section I6.5.1 for any spills, leaks, or discharges of hazardous materials.

9. Clean and repair emergency equipment and return to a condition fit for reuse.

10. Replace all expendable supplies.

I6.3.10 Pressure Hazards Emergency Response

Shut off the transfer pump if there is evidence of a pressure problem.

I6.3.11 Fire Protection System Impairment or Outage

NA.

I6.4 NATURAL HAZARDS RESPONSE PLAN

I6.4.1 Volcanic Eruption and Ashfall

Volcanic eruptions and ash fallout from several Cascade mountains are a possibility. Notification to the facility if an ash fallout is imminent would be through the two-way radio.

I6.4.2 Seismic Event Response

The WHC Emergency Organization's primary role in a seismic event is to coordinate the initial response to injuries, fires, or fire hazards, and to take measures to contain or control radioactive and toxic material releases that could have an adverse impact.

I6.4.2.1 Building Emergency Organization Response During the Seismic Event. Each Building Emergency Response Organization must be ready to respond following a seismic event affecting the Hanford Site and WHC facilities, personnel, and property. The following guidelines identify the responses necessary to respond to a seismic event at this facility.

1. Promptly assess post-earthquake emergency needs.
2. Take necessary actions to protect facility, onsite, and offsite personnel.
3. Report needs to the 811 number or ECC.
4. Search for injured or trapped employees.
5. Conduct accountability.
6. Render first aid.
7. Search for fires and other hazards.
8. Fight fires.
9. Perform facility inspection.
10. Consider shutdown of operating systems.
11. Arrange for rescue of personnel.
12. Form a recovery plan.
13. Perform cleanup.

I6.4.2.2 Employee Response During the Seismic Event. During the earthquake, building personnel should perform the following actions.

1. Remain calm.
2. Avoid objects that could fall or release hazardous material.

I6.4.2.3 Response Following the Seismic Event. After the earthquake, perform the following actions.

1. Follow instructions of the BED.
2. Check fellow workers for injuries and administer first aid.
3. Call 811 via two-way radio for emergency assistance and notify Operation Manager.
4. Do not use matches or lighters.
5. Do not touch downed power lines or objects touched by downed wires.

6. Establish damage assessment teams for the local area and areas beyond the facility background.

7. Determine if release of hazardous material inventories (both radioactive and nonradioactive) is occurring or likely to occur. If so, implement the spill response plan described in Section I6.5.1.

8. Determine current local meteorology.

9. Warn adjacent facilities of the event by using radios, runners, or vehicles.

10. Initiate road closures (onsite roadways) to reduce potential exposures.

11. Provide resources and personnel assistance to affected personnel and facilities.

I6.4.3 High Winds or Tornadoes

High winds or tornadoes at the LERF can be complicated by the potential presence of dangerous wastes and low-level radioactive material that could cause contamination. The avoidance of breaching containment of the storage facilities is extremely important.

The following actions are the responsibility of the BED, or alternate, and should be taken if high winds or tornadoes occur at the LERF.

1. Personnel who learn of high wind or tornado conditions are to notify the BED of the situation.

2. Take the necessary actions to protect personnel including facility visitors.

3. Seek some form of shelter, away from falling or blowing objects.

4. Stay under cover until event subsides, as directed.

5. The BED will announce an "all clear" signal, after the danger has dissipated and there is no longer an imminent threat to human health.

6. Search for injured or trapped employees within proximity to the facility.

7. Remove injured to safe area; provide immediate first aid and prepare for transport to a full service medical facility.

8. Assess and identify damage or hazards.

9. If necessary, contact 811 via the two-way radio for emergency assistance.

10. Isolate any hazardous materials and stabilize until they can be removed in a nonemergency mode and properly treated or disposed.

11. Stand by for further instructions from the BED.

I6.4.4 Flood

NA. A flood is not considered a credible event at the Tank Farms.

I6.4.5 Range Fire

Fire fighting in the LERF can be complicated by the potential presence of dangerous wastes and a lesser potential for low-level radioactive material that could cause contamination. The avoidance of breaching containment of the basins is extremely important.

The following actions are the responsibility of the BED, or alternate, and should be taken if a fire is detected or an explosion occurs at the LERF.

1. Personnel discovering the fire shall notify the BED via relayed message over two-way radio.

2. Call 811 and request Fire Department support.

3. Confer with Health Physics for contamination controls and area postings if radioactive contaminants are present.

4. Assign a person to meet the Fire Department and direct them to the location of the alarm or fire.

5. Proceed to the scene of the incident and make an assessment of the situation; request assistance if necessary.

6. Facility occupants should respond to the fire by attempting to extinguish it with the portable fire extinguisher.

7. The Fire Department HAZMAT Team, if required, will proceed to the scene of the incident and, coordinating with the BED, initiate actions to control the incident.

8. Establish an incident command post in a safe location and request additional assistance as necessary.

9. Remove injured personnel to a safe area, provide immediate first aid, and prepare for transport to a full-service medical facility for medical treatment.

10. Establish roadblocks, as necessary, to prevent unauthorized personnel from entering.

11. After the fire has been controlled and extinguished, or the cause of the explosion has been eliminated and there is no longer an imminent threat to human health, the BED will announce an "all clear" signal.

12. Isolate and stabilize any hazardous materials until they can be removed in a nonemergency mode and properly treated or disposed according to the spill response plan described in Section I6.5.1.

13. Clean and repair emergency equipment and return to a condition fit for reuse.

14. Replace all expendable supplies.

I6.5 HAZARDOUS MATERIALS AND MIXED WASTE RESPONSE PLAN

Discovery of a nonradioactive hazardous material or mixed waste spill could be made by anyone. Emergency equipment could be used by individuals discovering a spill providing that the individuals have been properly trained in the use of the spill equipment and use proper respiratory and personnel protective equipment.

I6.5.1 Spill Response Plan

The following responses should be taken in response to a spill of hazardous material. The BED has overall responsibility to ensure proper response to emergency situations. Because the BED normally will not be present at the facility, first line management or senior personnel will assume these responsibilities and be assigned as emergency coordinators as described in the Emergency Call List.

1. Assess the severity of the situation.

2. If the release can be controlled safely and promptly, do so; if not, notify the BED.

3. The BED, emergency coordinator, or an alternate will assess the situation and determine the type and quantity of materials released and the hazards involved.

4. Notify personnel in the immediate area of the incident.

3. Terminate transfers from the tanker truck to the basins.

5. Terminate intertank transfers.

6. Stand by for further instructions.

7. If response is within the capabilities of the Building Emergency Response Organization, actions appropriate for the waste or material involved shall be initiated to contain and control the release.

8. If beyond the capabilities of the Building Emergency Response Organization, the BED will notify the POC at 811 to request additional assistance.

9. Direct facility personnel to take those actions that can be safely performed to control or contain the release before arrival of requested assistance.

10. Direct an individual to meet the emergency responders from outside the facility and direct them to the event scene.

11. The Fire Department HAZMAT Team will proceed immediately to the scene of the incident and, coordinating with the BED, initiate actions to control the incident.

12. Establish an incident command post in a safe location and request additional assistance as necessary.

13. Rescue personnel, provide immediate first aid, and prepare for transport to a full-service medical facility.

14. Establish roadblocks or other traffic control measures to prevent unauthorized personnel from entering the area.

15. After the release has been contained and controlled, and there is no longer an imminent threat to human health, announce an "all clear" signal.

16. Residual hazardous materials will be isolated and stabilized as follows.

    a. **Major Spills.** If total loss of containment has already occurred with a major spill resulting, the response plan given below will be initiated.

       The recovery phase of the accident is not handled under emergency criteria but, rather, according to a recovery plan developed for the specific event. Thus, the facility manager will create an emergency organization encompassing all required aspects of engineering, operations, maintenance, and functional support, with direction provided by the Hazardous Waste Unit and Industrial Hygiene in accordance with

WAC 173-303-145 and DOE Order 5484.1, *Environmental Protection - Safety and Health Protection Information Reporting Requirements*. This will include making proper notifications to official agencies (i.e., DOE, U.S. Environmental Protection Agency, or Washington State Department of Ecology). Personnel will recapture (where possible), store, and dispose of any material that is released. Personnel will store and dispose of any contaminated soil or surface water or any other material that results from a spill, toxic fume generation, fire, or explosion.

b. **Minor Spills.** Use the absorbent material in the storage shed to cover and absorb minor spills. Remove the absorbent and any wetted soil with the shovels provided and place inside of the waste storage containers. Major spills will be responded to in accordance with Step a above. Spills or leaks must be monitored by Health Physics to determine the level of radioactivity and the areas affected. Spills or leaks must also be sampled for hazardous components in accordance with step a above.

c. **Leaks During Transfers.** If a leak occurs during a transfer from the 242-A Evaporator into the LERF, or during an interbasin transfer, cease the transfer, and notify Tank Farms Supervision immediately. A rupture to transfer lines could constitute a major spill and the provisions of step a above must be followed.

17. Emergency and containment equipment used in the response to the incident will be cleaned and returned to a condition fit for reuse after the cleanup is completed. All expendable supplies that were used will be replaced.

I6.5.2 Fire and Explosion Associated with Hazardous Materials

Explosions may be the cause or result of a fire or may be totally disassociated. For this plan, fire and explosion are treated simultaneously. Special chemical hazards are addressed in the "Prefire Plans" of the Fire Department that is located in the 200 West Area.

I6.5.2.1 Discoverer of Fire

1. Avoid inhaling smoke, fumes, or vapors even if no hazardous waste is involved.

2. Call 811 using the two-way radio.

3. Notify the BED or Operations shift office. Provide as much information as possible without personal risk.

4. Move and keep people away from the fire scene.

5. The BED, emergency coordinator, or alternate will identify the character, exact source, amount, and extent of any released materials. Request support from Process Engineering for this effort.

6. If the emergency involves a hazardous waste storage area, contact the hazardous waste coordinator, or cognizant engineer, to identify the materials involved.

7. Contact the POC at 811 or 3-3800 via two-way radio and provide as much information as possible. Request additional assistance as required.

I6.5.2.2 Building Emergency Director Actions

1. Evacuate part or all of the facility.

2. Ensure that the Fire Department HAZMAT Team has been notified.

3. Relay pertinent information, including the proposed location of the Technical Support Center.

4. Establish a command post in a safe location.

I6.5.3 Toxic Fume Release

Discovery of a nonradioactive hazardous material toxic fume release may be made by anyone. Rapid communication is a vital part of warning personnel and notifying appropriate response personnel.

I6.5.3.1 Discoverer. The person discovering the toxic fumes shall take the following immediate actions.

1. Assume a fume release is toxic unless it is absolutely known to be harmless.

2. Avoid inhaling smoke, fumes, or vapors even if no hazardous waste is involved.

3. Do not assume that gases or vapors are harmless because of lack of odor.

4. Contact the BED or Operations shift office immediately. Provide as much information as possible without personal risk.

5. Keep people away from the area of the release.

I6.5.3.2 Building Emergency Director. The BED or emergency coordinator must immediately take the following actions.

1. Identify the character, exact source, amount, and extent of any released materials.

2. Refer to the Material Safety Data Sheets for information concerning what type of respiratory and personnel protective equipment should be used to isolate the spill area or stop the leak.

3. If the emergency involves a hazardous waste storage area, contact the plant hazardous waste coordinator to identify the materials involved.

4. If assistance is required, notify the POC at 811 or 3-3800 and request that the Fire Department HAZMAT Team be dispatched. Provide as much information as possible.

5. Assign a representative to meet and direct the HAZMAT Team to the area of the spill.

6. Assess possible hazards to human health and the environment (considering direct, indirect, immediate, and long-term effects) that may result from the spill.

7. Contact Pacific Northwest Laboratory Meteorology Weather Station on 3-2716 to determine the wind speed, direction, and plume stability.

8. Take all reasonable measures necessary to ensure that fires, explosions, and releases do not occur, recur, or spread to other dangerous waste at the facility.

9. Where applicable, stop operations, collect and contain released waste, and remove or isolate containers.

10. Evaluate the need to evacuate the facility. Take into account the location of the spill and ensure the safety of the evacuation staging area.

I6.5.4 Reactive Chemical or Corrosive Material Hazard

NA.

I6.5.5 Thermal Reaction and Hazard

NA.

I6.5.6 Flammable Liquids and Materials

Gasoline is the only flammable material present at the facility. Response to fires from gasoline is discussed in Section I6.3.8.

I6.5.7 Asbestos Release

NA.

I6.6 RADIOACTIVE MATERIALS RESPONSE PLAN

If an unexpected accident occurs involving radioactive material that exceeds set limits as summarized by WHC-CM-7-5, *Environmental Compliance Manual*, the following responses are required.

I6.6.1 Radioactive Gaseous Effluent Discharge--Stack Alarm

NA.

I6.6.2 Radioactive Liquid Effluent Discharge

NA.

I6.6.3 Significant Contamination Spread

Typically, the contamination spread will be indicated by visual observation of leaks or containment loss. If these leaks involve radioactive contaminants, personnel shall respond by carrying out the following activities:

1. Holding one's breath
2. Moving upwind from the source
3. Contacting Health Physics and standing by for survey and contamination status
4. Notifying immediate manager and BED.

I6.7 CRITICALITY RESPONSE PLAN

NA.

I6.8 EXPLOSIVE MATERIALS AND MUNITIONS HAZARDS RESPONSE PLAN

NA.

I6.9 PREVENTION OF RECURRENCE OR SPREAD OF FIRES, EXPLOSIONS, OR RELEASES

Refer to Section 6.9 of this BEP.

I7.0 TERMINATION OF EMERGENCY

Refer to Section 7.0 of this BEP.

I8.0 ACCIDENT RECOVERY

Refer to Section 8.0 of this BEP.

I9.0 POSTEVENT ANALYSIS AND REPORTING REQUIREMENTS

Damage assessments should be made at the conclusion of the emergency phase. The results of these assessments must be communicated to the ECCs. The BED should designate a recovery manager who will determine necessary steps to return the facility to an operational status. The following items should be considered:

- Primary containment
- Secondary containment
- Leak detection system
- Transfer and piping systems
- Structural integrity.

CONTENTS

CONTENTS (cont)

FIGURE

TABLES

8.0 PERSONNEL TRAINING [H]

This chapter outlines the training program developed and implemented by Westinghouse Hanford for the Waste Tank safety, operations and remediation employees whose duties are identified as being associated with dangerous waste management.

The Tank Farm Project training program uses existing Westinghouse Hanford courses. The program was designed to ensure that the LERF is operated and maintained in accordance with requirements of the EPA, Ecology, Occupational Safety and Health Administration, and U.S. Department of Energy.

8.1 OUTLINE OF THE TRAINING PROGRAM [H-1]

The Tank Farm Project training program is designed to prepare employees to operate and maintain the LERF in a safe, effective, efficient, and environmentally sound manner. In addition to preparing employees to operate and maintain the LERF under normal conditions, the program ensures that employees are prepared to respond in a prompt and effective manner, should abnormal or emergency conditions occur. Emergency response training is consistent with emergency responses outlined in the contingency plan (Appendix 7A).

The Tank Farm Project training program includes training courses that cover training requirements for nuclear operators who operate the LERF. The Tank Farm Project in cooperation with Technical Training, Industrial Safety and Fire Protection, Process Engineering Laboratory Training, Health Physics Training, and other Westinghouse Hanford organizations, is responsible for the development and administration of the comprehensive training program for employees assigned to, or involved with, the Tank Farm Project. The Tank Farm Project management is responsible for identifying training requirements for Tank Farm Project personnel and ensuring that personnel complete appropriate training. The responsibilities of the various organizations are discussed in Section 8.1.3.

An initial job analysis process was completed on the Tank Farm Project, which resulted in identifying the required training to operate the LERF in a safe and effective manner.

A job analysis process, currently used by Westinghouse Hanford, will be used to guide reevaluations of the Tank Farm Project training program to ensure that operational and dangerous waste training requirements continue to be met. These reevaluations may result in modifying or adding new material to the current training program.

8.1.1 Job Titles and Descriptions [H-1a]

Within Westinghouse Hanford, each employee is assigned a job title (from the salaried nonexempt or bargaining unit classifications) or position (from the exempt classification). Job titles and positions for employees that are associated with processing dangerous waste at the Tank Farm Project are listed in the following sections with brief descriptions of associated responsibilities.

8.1.1.1 Tank Farm Project Director and Deputy Director. Responsibilities of the Tank Farm Project director and deputy director include the following:

- Operating and maintaining the Tank Farm in compliance with U.S. Department of Energy directives, Westinghouse Hanford policies and procedures, and approved safety analysis reports

- Complying with all effluent and hazardous and dangerous waste policies, procedures, and regulations

- Recruiting and developing a trained cadre of managers, professionals, nonexempt, and bargaining unit employees

- Ensuring safe and disciplined operations by trained personnel who implement Westinghouse Hanford policies and procedures

- Ensuring the Tank Farm Project safety analysis reports and other documents related to the safe operation and maintenance of the Tank Farm Project are accurate and up-to-date

- Ensuring the proper allocation of resources required to support the operation, maintenance and plant modification, and installation of new equipment required for safety and to meet production schedules

- Providing operational requirements for Westinghouse Hanford support organizations to plan and provide services and resources when needed

- Promoting safe operations of the Tank Farm Project.

8.1.1.2 Facility Operations Manager and East/West Tank Farm Operations Managers. Responsibilities of the Facility Operations manager and East/West Tank Farm operations managers include the following:

- Planning, organizing, and coordinating the processes, production and surveillance activities for the LERF

- Coordinating and directing the activities of shift operations manager and surveillance manager

- Promoting safe operations of Tank Farm Project facility operations

- Enforcing safety, housekeeping, and general plant rules

- Conducting operations according to established procedures
- Meeting quality assurance requirements
- Statusing and resolving action items arising from audits, inspections, and unusual occurrences
- Supervising emergency response and recovery actions
- Maintaining administrative controls
- Supervising procedure compliance
- Minimizing injuries and/or equipment damage
- Ensuring compliance of operating limits and specifications
- Performing the duties of the building emergency director during emergencies
- Assuming charge during emergencies until properly relieved by upper management or building emergency director
- Ensuring staff levels and training are adequate for safe and effective facility operations
- Directing, controlling, and coordinating the receipt, transfer, and processing of high-level radioactive waste and dangerous waste
- Coordinating the recovery, measuring, and reestablishing control of unplanned releases to the environment and other emergency conditions.

8.1.1.3 Shift Operations Manager, Shift Manager, and Shift Supervisor. Responsibilities of the shift operations manager, shift managers, and shift supervisors include the following:

- Supervising, coordinating, and directing the activities of shift managers and shift supervisors
- Promoting safe operation of the Tank Farm Project facility operations
- Enforcing safety, housekeeping, and general operating rules
- Conducting operations according to established procedures
- Supervising, coordinating, and directing the activities of the nuclear process operators
- Maintaining control over facility operations in accordance with established operating procedures, Westinghouse Hanford policies, U.S. Department of Energy Orders, and federal and state regulations

- Recognizing nonstandard conditions and taking appropriate action

- Training and/or arranging training for personnel

- Maintaining essential records

- Supervising emergency response and recovery actions

- Maintaining administrative controls

- Conducting pre-job safety and planning meetings with personnel involved with the facility operations

- Ensuring that nuclear operators are trained

- Minimizing injuries and/or equipment damage

- Ensuring compliance to operating limits and specifications

- Ensuring radiation exposure and dangerous waste exposure are maintained ALARA

- Serving as designated alternates to the building emergency director and the staging area manager

- Responding to abnormal and/or emergency conditions according to established procedures

- Assuming charge during emergencies until properly relieved by upper management or the building emergency director.

8.1.1.4 Surveillance Manager and East Tank Farm Surveillance Supervisor. Responsibilities of the surveillance manager and East Tank Farm surveillance supervisor include the following:

- Supervising, coordinating, and directing the activities of the surveillance supervisor

- Supervising, coordinating, and directing the activities of the surveillance nuclear operators

- Maintaining control over Tank Farm Project surveillance operations in accordance with established operating procedures, Westinghouse Hanford policies, U.S. Department of Energy Orders, and federal and state regulations

- Recognizing nonstandard conditions and taking appropriate action

- Training and/or arranging training for personnel

- Maintaining essential records

- Supervising emergency response and recovery actions
- Maintaining administrative controls
- Supervising procedure compliance
- Conducting pre-job safety and planning meetings with surveillance personnel involved with facility operations
- Ensuring that surveillance nuclear operators are trained
- Minimizing injuries and/or equipment damage
- Directing and scheduling operations to operate dry-well monitoring equipment, monitoring horizontal laterals, taking daily liquid level measurements and pond readings, taking in-tank photography of underground waste storage tanks, and taking underground waste line encasement swab readings
- Responding to and providing remedial guidance and decisions for surveillance anomalies, off-standard conditions, and equipment malfunctions
- Notifying Facility Operations management of any unplanned releases to the environment
- Ensuring radiation exposure and dangerous waste exposure are maintained ALARA
- Reviewing and distributing the daily and weekly inspection datasheets
- Responding to abnormal and/or emergency conditions according to established procedures
- Assuming charge during emergencies until properly relieved by upper management or the building emergency director.

8.1.1.5 **Nuclear Operator.** Responsibilities of the nuclear operator (shift and surveillance nuclear operators) include the following:

- Performing work activities in accordance with current operating procedures
- Attending work plan and pre-job safety meetings
- Escorting and supporting crafts and visitors entering the LERF
- Conducting routine inspections
- Performing sampling as required by procedure

- Operating processes equipment
- Performing walk-down inspection in accordance with the daily inspection datasheet
  - Noting negative findings and corrective actions to be taken
  - Completing the daily inspection datasheet
- Performing walk-down inspection in accordance with the weekly inspection datasheet
  - Performing inspection in accordance with the weekly inspection datasheet
  - Noting negative findings and corrective actions to be taken
  - Inspecting for deterioration
  - Completing weekly inspection datasheet
- Providing surveillance for abnormal conditions
- Observing all safety precautions
- Responding to abnormal and/or emergency conditions according to established procedures
- Notifying shift operations and/or surveillance operations in the event of a spill or emergency
- Responding to leaks or spills or radioactive, mixed, or dangerous waste
- Responding to Tank Farm panel alarms.

8.1.1.6 **Health Physics Supervisor.** Responsibilities of the health physics supervisor include the following:

- Providing health physics support for Tank Farm Project operations
- Providing current radiation work permits for all personnel working in the Tank Farm Project
- Overseeing on-the-job training for health physics technicians
- Providing direction and guidance to Tank Farm Project management concerning radiological conditions

- Providing immediate health physics support in an emergency

- Responding to abnormal and/or emergency conditions according to established procedures.

8.1.1.7 **Health Physics Technician.** Health physics technicians include health physics technician-trainees, health physics technicians, and senior health physics technicians. Responsibilities of the health physics technicians include the following:

- Operating radiation and contamination sampling systems

- Issuing supplemental dosimeters

- Providing dose rate monitoring support

- Surveying personnel out of radiation areas

- Maintaining all radiation equipment records

- Prescribing protective clothing necessary to perform work in radiation and contamination areas

- Responding to all radiation alarms

- Collecting air samples

- Locating radiation and contamination boundary perimeters for nuclear operators when fences and barriers are being erected

- Responding to all radiation alarms

- Performing routine surveillance

- Documenting all support provided for personnel at the Tank Farm Project

- Overseeing work activities to ensure exposure of personnel to radiation is ALARA

- Responding to abnormal and/or emergency conditions according to established procedures.

8.1.1.8 **Plant Engineering Manager, East Cognizant Engineering Manager, and Engineer.** Responsibilities of the plant engineering manager, East cognizant engineering manager, and engineers include the following:

- Providing the operating organizations with equipment and plant conditions that promote safe and productive operations

- Ensuring that the plant engineering staff is knowledgeable of procedures, equipment, plant conditions, and processes such that they can identify problem areas and provide remedial action in a timely fashion to keep the plants operating safely and productively

- Maintaining Tank Farm Project instrumentation and equipment flow diagrams that are technically correct and reflect the current configuration of the process system

- Reviewing and approving Tank Farm Project work authorizations and assigning impact levels

- Providing plant instrumentation surveillance calibration and evaluation system input range changes

- Planning and integrating all resources required to meet nonproject plant design objectives, schedules, and milestones identified on cost account plans and master schedules

- Negotiating and integrating supporting work from organizations within responsible cost accounts

- Conducting regular self-monitoring and appraisal of group performance and taking appropriate action when deemed necessary to improve group performance

- Preparing/approving engineering design documents and drawings that are in compliance with applicable company policies, procedures, and instructions, and are in accordance with recognized national standards and codes

- Preparing or directing the preparation of all engineering change notices

- Maintaining and updating design engineering drawing files

- Preparing and approving equipment/material specifications for new nonproject design and equipment purchase requisitions including impact levels

- Acting as the point of contact for resolution and disposition of nonconformance material and equipment through the Material Review Board

- Preparing nonproject design criteria, performing and approving design analysis, and assigning impact levels on design.

8.1.1.9 Process Engineering Manager, East Process Engineering Manager, and Process Engineer. Responsibilities of the process engineering manager, East process engineering manager, and process engineers include the following:

- Overseeing and directing the activities of the cognizant process engineering staff such that operation processes can be operated in a safe, efficient, and technically sound manner

- Ensuring operations process equipment and procedures comply with U.S. Department of Energy Orders, federal and state regulations, national standards, and Westinghouse Hanford engineering procedures and standards

- Issuing and maintaining operations operating documentation, operating procedures, flowsheets, sample schedules, specifications, process test plans and procedures, operational safety requirements, and other documents necessary to operate

- Performing routine and comprehensive evaluations of operation processes to ensure compliance with process control requirements and procedure compliance, and assessing problem areas and implementing timely corrective actions

- Providing support for process control engineers in troubleshooting of process upsets

- Recruiting, training, certifying, appraising, and developing a highly competent and professional engineering staff to carry out process engineering responsibilities

- Preparing, issuing, and ensuring operating procedures are technically correct, preparing and issuing procedure departure authorizations to correct procedures, and supporting process changes

- Performing daily, routine, comprehensive evaluation of operation process parameters to ensure compliance with the process control manual, final safety analysis reports, criticality safety analysis review, and flowsheet requirements

- Updating and obtaining approvals for operation process control manual changes

- Revising and updating operation flowsheets and rate sheets

- Preparing and approving operation process memoranda, process test plans, and work plans

- Responding to abnormal and/or emergency conditions according to established procedures.

8.1.1.10 Quality Assurance Manager and Quality Assurance Engineer. Responsibilities of the quality assurance manager and quality assurance engineers include the following:

- Providing quality planning to ensure that requisite quality is attained and ensuring compliance with technical requirements, including all U.S. Department of Energy-approved requirements and applicable codes and standards

- Investigating, analyzing, and evaluating, in concert with engineering, all reported nonconformance from approved technical requirements and approving disposition actions defined by nonconformance reports for all nonconforming items

- Reviewing supplier, contractor, and Westinghouse Hanford status reports, audit reports, inspection reports, nonconformance reports and unusual occurrence reports to determine existing or potential problems

- Establishing inspection procedures and controls that provide data necessary to resolve disposition of nonconformance or other quality problems. Obtaining commitments from supplier and contractor or Westinghouse Hanford management to take corrective action to solve root causes of problems and following-up to ensure the effectiveness of actions taken

- Reviewing and approving engineering drawings, specifications, and other technical documents specifying design and fabrication requirements, and changes thereto, to ensure adequacy of definition of quality provisions

- Planning and performing quality assurance surveillance of contractors and individual organizations to assess compliance with quality requirements, issuing reports of findings, and following-up as required to effect timely implementation of necessary corrective actions

- Performing quality engineering tasks and activities as related to design, procurement, program and project planning, procedures, event reporting, readiness reviews, surveillance and assessments, audits, trend analysis, corrective actions, and documentation

- Assisting in studies, development, testing, and analysis of designs, processes, and procedures

- Collecting and compiling technical information for review and assisting in the preparation of technical specifications, reports, procedures, and other quality related documents

- Performing cognizant quality engineering duties within the scope of the abilities of the quality assurance engineers and the technical complexity of the system.

8.1.1.11 Quality Control Manager and Quality Control Inspector. Responsibilities of the quality control manager and quality control inspectors include the following:

- Managing and directing the conduct of compliance and conformance verification activities by quality control personnel to ensure consistent application with Westinghouse Hanford requirements

- Selecting and assigning qualified personnel to implement the quality assurance and quality control procedures, management of information, and Tank Farm Project quality plans

- Establishing standards and goals for quality control personnel and implementing procedures and instructions for their accomplishment

- Implementing a quality control surveillance program to monitor and ensure that all critical characteristics are reviewed for strict compliance with Westinghouse Hanford policies and procedures

- Developing and implementing systems to identify, control, and monitor nonconforming conditions and activities and providing investigative and verification support to include sound recommendations leading to prompt corrective actions

- Performing scheduled and unscheduled surveillances and inspections, and documenting results for follow-up actions

- Participating in the planning and performance of complex surveillances and inspections of maintenance, fabrication, and operation activities and verifying compliance with engineering and quality assurance parameters

- Performing source inspection and acceptance of procured equipment, materials, or assemblies

- Assisting quality engineers in tabulating, charting, and analyzing quality assurance data

- Researching and compiling information to evaluate qu~lity performance trends.

8.1.1.12 Industrial Safety Manager and Safety Engineer. Responsibilities of the industrial safety manager and safety engineer include the following:

- Overviewing all inspections and ensuring compliance with U.S. Department of Energy orders and Westinghouse Hanford standards and requirements affecting occupational safety

- Conducting Tank Farm Project inspections, audits, appraisals, etc., and monitor compliance with Industrial Safety programs, orders, and standards

- Providing expert advice to assist all Westinghouse Hanford organizations to effectively meet their occupational safety responsibilities

- Providing day-to-day task direction to Fire Protection and Program Integration, Industrial Hygiene, and Hazardous Materials personnel necessary to support the programs of each Industrial Safety site office

- Conducting investigations of major accidents or incidents

- Evaluating, selecting, and/or modifying engineering techniques to resolve problems

- Interfacing with intra-departmental engineers and support groups such as Purchasing, Quality Assurance, and Safety; also interfacing with customers, other contractors, and the DOE-RL on technical proposals

- Performing tasks that include design, analysis, testing, and preparation of specifications for systems, materials, equipment, or components

- Working with other technical staff performing work related phases and maintaining cognizance of the work performed on other projects in areas of responsibility

- Demonstrating creative ability through ingenuity exercised in problem solving and in preparing technical manuals, reports, and procedures.

8.1.1.13 Tank Farm Environmental Engineering Manager and Environmental Control Officer. Responsibilities of the Tank Farm environmental engineering manager and environmental control officer include the following:

- Ensuring Tank Farm Project compliance with environmental regulations

- Reviewing and approving of environmental data for Tank Farm Project

- Ensuring EPA and Ecology reporting requirements are adhered to

- Reviewing and approving new or revised permits

- Serving as the single point of contact for environmental related matters

- Managing Tank Farm Project environmental program corrective actions status to comply with dangerous waste permits

- Coordinating the review and submittal of environmental data for

- Annual dangerous waste report
- Waste minimization report
- Waste volume projections (solid and liquid)
- *Superfund Amendments and Reauthorization Act of 1986* (SARA) Section 312 Inventory Forms
- *Superfund Amendments and Reauthorization Act of 1986* (SARA) Section 313 Releases
- EPA surveys

• Preparing and providing input to reporting of

- Spill information
- Interim compliance status
- EPA and Ecology reporting requirements

• Coordinating the development and review of new or revised

- RCRA Part A permits
- RCRA Part B permits
- Closure plans
- Clean air permits
- National Pollution Discharge Elimination System (NPDES) permits and well registrations

• Ensuring implementation of permitting requirements and conducting periodic surveillances of compliance assessment with permits, and maintaining active permits in an up-to-date condition

• Resolving regulatory interpretations required to operate waste management units through interface with the Environmental Division, DOE-RL, Ecology, EPA, and health departments.

8.1.1.14 Waste Operations Manager and Engineer. Responsibilities of the waste operations manager and engineers include the following:

• Managing, coordinating, and directing the activities of the Waste Handling Control Group

• Preparing, issuing, and approving environmental waste handling procedures

- Determining and issuing environmental waste handling, packaging, and shipping requirements

- Assessing environmental waste handling problem areas and implementing corrective action

- Approving waste container control

- Maintaining electronic tracking of environmental waste.

8.1.1.15 **Maintenance Manager, Maintenance Engineering Services Manager**, and **Maintenance Engineer.** Responsibilities of the maintenance manager, maintenance engineering services manager, and maintenance engineers include the following:

- Ensuring compliance with Westinghouse Hanford requirements, applicable policies, programs, regulations, and U.S. Department of Energy directives to ensure personnel safety, environmental compliance, and public safety

- Assisting in detailed planning of schedules and budgets to ensure that work is performed in accordance with established schedules and within budget

- Evaluating and modifying maintenance procedures and work plans, and ensuring procedures are current and accurate

- Providing assistance to equipment and system efforts through direct support to maintenance and providing person-in-charge services for complex maintenance and/or installation activities

- Performing root-cause analyses as required to determine equipment, system, or personnel induced failures of maintenance systems or equipment, performing failure history analyses, and recommending changes as appropriate

- Ensuring requirements are identified for each assigned Tank Farm Project unit; giving particular attention to items supporting safety systems

- Providing technical support for maintenance services

- Identifying preventive maintenance requirements and deficiencies

- Developing and/or modifying preventive maintenance activities

- Conducting equipment and Tank Farm Project walkdowns and providing recommendations for reliability improvements

- Providing for continued input and development of the equipment history file in support of trend analysis reviews and specific problem resolution

- Conducting critical equipment failure analysis with cognizant system engineer

- Providing direct technical guidance support to the maintenance performance group in conjunction with the cognizant system engineer

- Responding to abnormal and/or emergency conditions according to established procedures.

8.1.1.16 Craft Management Manager, Tank Farm Craft Maintenance, East Manager and Supervisor. Responsibilities of the craft maintenance manager, Tank Farm craft maintenance, East manager and supervisor include the following:

- Supervising, coordinating, and directing the activities of maintenance supervisors

- Promoting safe operation of the Tank Farm Project

- Enforcing safety, housekeeping, and general operating rules

- Conducting operations according to established procedures

- Supervising, coordinating, and directing the activities of the maintenance crafts

- Recognizing nonstandard conditions and taking appropriate action

- Training and/or arranging training for personnel

- Maintaining essential records

- Supervising emergency response and recovery actions

- Maintaining administrative controls

- Conducting pre-job safety and planning meetings with personnel involved with the Tank Farm Project

- Ensuring that maintenance crafts are trained

- Minimizing injuries and/or equipment damage

- Ensuring radiation exposure and dangerous waste exposure are maintained ALARA

- Responding to abnormal and/or emergency conditions according to established procedures

- Assuming charge during emergencies until properly relieved by upper management or the building emergency director.

8.1.1.17 **Maintenance Crafts.** Crafts include electricians, instrument technicians, iron workers-riggers, millwrights, pipefitters, and welders. Responsibilities of the maintenance crafts include the following:

- Providing routine and emergency maintenance services

- Responding to abnormal and/or emergency conditions according to established procedures.

8.1.1.18 **Laboratory Manager.** Responsibilities of the laboratory manager include the following:

- Managing, coordinating, and directing the activities of assigned personnel to attain safe and efficient operation of analytical laboratories

- Ensuring that nuclear materials assigned to the laboratories are properly safeguarded and controlled in accordance with approved procedures and policies

- Providing quality analytical results in a timely manner to all processing plants and to environmental monitoring personnel required to make process, safety, and security decisions

- Ensuring that all process control and nuclear accountability standards are analyzed and reported to the laboratory measurement control system

- Ensuring all personnel are trained and qualified for the tasks being performed

- Managing overall laboratory operation

- Supervising chemical technologists and chemists/scientists who provide process and dangerous waste analysis support for the Tank Farm Project

- Authorizing (or delegating authority to authorize) the release of data

- Responding to abnormal and/or emergency conditions according to established procedures.

8.1.1.19 **Chemist/Scientist.** Responsibilities of the chemist/scientist include the following:

- Setting up, testing, and monitoring performance of analytical methods and instruments

- Providing dangerous waste analysis support, analysis oversight, and supervising first line laboratory management, which includes training chemical technologists to laboratory procedures

- Developing routine and nonroutine sample characterization procedures as well as modifying or updating procedures as necessary

- Verifying and checking reported data

- Responding to abnormal and/or emergency conditions according to established procedures

- Directing activities outside routine procedures during abnormal operating conditions.

8.1.1.20 **Chemical Technologist.** Responsibilities of the chemical technologists include the following:

- Providing radiological and dangerous waste sampling and analysis support for the Tank Farm Project (physical property determinations, chemical composition determinations, and routine laboratory operations)

- Setting up and testing analytical instrumentation under the direction of a chemist

- Performing repetitive and nonroutine analyses for characterization of methodology, equipment, or samples

- Training other technicians, scientists, and other less experienced personnel in radiation practices and methodology

- Performing ancillary duties (i.e., nuclear material inventory and property inventory as requested by management)

- Reporting data

- Responding to abnormal and/or emergency conditions according to established procedures.

8.1.1.21 **Tank Farm Project Hazardous Material Coordinator.** Responsibilities of the Tank Farm Project hazardous material coordinators include the following:

- Overseeing the administrative functions involved in the segregating, minimizing, collecting, disposing, and shipping of hazardous or dangerous materials

- Responding to abnormal and/or emergency conditions according to established procedures.

8.1.1.22 **Hanford Fire Department.** Responsibilities of the Hanford Fire Department include the following:

- Responding to emergencies

- Providing fire suppression for fires and explosions

- Providing control and containment of nonradioactive hazardous material accidents or incidents

- Providing emergency medical attention for injured personnel.

8.1.2 Training Content, Frequency, and Techniques [H-1b]

This section provides an overview of job-specific training provided to personnel in job positions discussed in the previous sections. In addition to normal operating conditions, personnel with these job positions are instructed on communications and alarm systems and the proper response to abnormal conditions and emergencies such as fire, radiological incidents, dangerous waste incidents, and shutdown of operations.

8.1.2.1 **Overview of Training for Specific Positions.** All Tank Farm Project personnel receive applicable company-general, plant-specific, and job-specific training. The courses are given in classroom settings, on-the-job training, self-study units, and computer-based training. Tables 8-1 through 8-6 consist of matrices that relate job position to the individual training courses. Table 8-7 provides employee work category definitions. The following sections provide an overview of job-specific training.

8.1.2.1.1 **Tank Farm Project Director and Deputy Director Training.** The Tank Farm Project director and deputy director complete specific courses in preparation for work assignments, including hazardous material and dangerous waste training courses. The courses address Tank Farm Project waste management procedures, U.S. Department of Energy directives, Westinghouse Hanford policies, and federal and state regulations. The courses include the implementation of the Tank Farm Project contingency plan, use of emergency and monitoring equipment, and how to cut off waste feed.

8.1.2.1.2 **Facility Operations Manager and East/West Tank Farm Operations Managers Training.** The Facility Operations manager and East/West Tank Farm operations managers complete specific courses in preparation for work assignments, including hazardous material and dangerous waste training courses. The courses address Tank Farm Project waste management procedures, U.S. Department of Energy directives, Westinghouse Hanford policies, and federal and state regulations. The courses include the implementation of the Tank Farm Project contingency plan, use of emergency and monitoring equipment, and how to cut off waste feed.

8.1.2.1.3 Shift Operations Manager, Shift Manager, and Shift Supervisor Training. The shift operations manager, shift managers, and shift supervisors complete specific courses in preparation for work assignments, including hazardous material and dangerous waste training courses. The courses address Tank Farm Project waste management procedures, U.S. Department of Energy directives, Westinghouse Hanford policies, and federal and state regulations. The courses include the implementation of the Tank Farm Project contingency plan, use of emergency and monitoring equipment, and how to cut off waste feed. The shift operations manager, shift managers, and shift supervisors are required to be qualified for assigned jobs through a systematic process as determined by management.

8.1.2.1.4 Surveillance Manager and East Tank Farm Surveillance Supervisor Training. The surveillance manager and East Tank Farm surveillance supervisor complete specific courses in preparation for work assignments, including hazardous material and dangerous waste training courses. The courses address Tank Farm Project waste management procedures, U.S. Department of Energy directives, Westinghouse Hanford policies, and federal and state regulations. The courses include the implementation of the Tank Farm Project contingency plan, use of emergency and monitoring equipment, and how to cut off waste feed. The surveillance manager and East Tank Farm surveillance supervisor are required to be qualified for assigned jobs through a systematic process as determined by management.

8.1.2.1.5 Nuclear Operator Training. Nuclear operators (shift and surveillance nuclear operators) complete specific courses in preparation for work assignments, including hazardous material and dangerous waste training courses. The courses address Tank Farm Project waste management procedures, U.S. Department of Energy directives, Westinghouse Hanford policies, and federal and state regulations. The courses include implementation of the Tank Farm Project contingency plan, routine inspections, use of emergency and monitoring equipment, and how to cut off waste feed.

Nuclear operators are required to be certified for assigned jobs. Those who are certified complete appropriate dangerous waste training. Operators recertify for assigned jobs at least biennially. The operators must complete the progression tests (general radio-chemical operator and plant-specific courses) at least annually. Once a nuclear operator reaches the nuclear process operator level, the progression tests are referred to as requalification tests and are a biennial requirement supplemented by an intervening biennial emergency procedures and abnormal plant conditions test. The combination of requalification tests and the emergency procedures and abnormal plant conditions tests ensures that nuclear operators continue to comply with the annual emergency training requirement.

8.1.2.1.6 Health Physics Supervisor Training. The health physics supervisor completes specific courses in preparation for work assignments, including hazardous material and dangerous waste training courses. The courses address Tank Farm Project waste management procedures, U.S. Department of Energy directives, Westinghouse Hanford policies, and federal and state regulations. The courses include the implementation of the Tank Farm Project contingency plan and use of emergency and monitoring equipment.

8.1.2.1.7 Health Physics Technician Training. The health physics technicians complete specific courses in preparation for work assignments, including hazardous material and dangerous waste training courses. The courses address Tank Farm Project waste management procedures, U.S. Department of Energy directives, Westinghouse Hanford policies, and federal and state regulations. The courses include the implementation of the Tank Farm Project contingency plan and use of emergency and monitoring equipment.

The health physics technicians are required to be certified for assigned jobs. The health physics technicians must certify for the level at which they are assigned work (i.e., health physics technician or senior health physics technician). They must complete their next-level certification tests between 15 and 18 months of arrival at the current level. Once a health physics technician reaches the senior health physics technician level, they must recertify at least biennially thereafter. The health physics technicians also must complete corresponding general and specific on-the-job training for each level.

The health physics technicians must complete the appropriate on-the-job training at least every 4 years thereafter. All health physics technicians must comply with the emergency procedures and abnormal plant conditions requirements and complete the hazardous worker training refresher course at least annually. Compliance is accomplished by health physics technicians completing the requirement with a written test or an on-the-job training checklist in alternating years.

8.1.2.1.8 Plant Engineering Manager, East Cognizant Engineering Manager, and Engineer Training. The plant engineering manager, East cognizant engineering manager, and engineers complete specific courses in preparation for work assignments, including hazardous material and dangerous waste training courses. The courses address Tank Farm Project waste management procedures, U.S. Department of Energy directives, Westinghouse Hanford policies, and federal and state regulations. The courses include the implementation of the Tank Farm Project contingency plan, and use, inspection, repair, and replacement of emergency and monitoring equipment.

8.1.2.1.9 Process Engineering Manager, East Process Engineering Manager, and Process Engineer Training. The process engineering manager, East process engineering manager, and process engineers complete specific courses in preparation for work assignments, including hazardous material and dangerous waste training courses. The courses address Tank Farm Project waste management procedures, U.S. Department of Energy directives, Westinghouse Hanford policies, and federal and state regulations. The courses include the implementation of the Tank Farm Project contingency plan, use, inspection, repair and replacement of emergency and monitoring equipment, and how to cut off waste feed. Process engineers are required to be qualified for assigned jobs through a systematic process as determined by management.

8.1.2.1.10 Quality Assurance Manager and Quality Assurance Engineer Training. The quality assurance manager and quality assurance engineers complete specific courses in preparation for work assignments, including hazardous material and dangerous waste training courses. The courses address waste management procedures, U.S. Department of Energy directives, Westinghouse Hanford policies, and federal and state regulations. The courses include the implementation of the applicable contingency plan and use of emergency and monitoring equipment.

8.1.2.1.11 Quality Control Manager and Quality Control Inspector Training. The quality control manager and quality control inspectors complete specific courses in preparation for work assignments, including hazardous material and dangerous waste training courses. The courses address waste management procedures, U.S. Department of Energy directives, Westinghouse Hanford policies, and federal and state regulations. The courses include the implementation of the applicable contingency plan and use of emergency and monitoring equipment.

8.1.2.1.12 Industrial Safety Manager and Safety Engineer Training. The industrial safety manager and safety engineers complete specific courses in preparation for work assignments, including hazardous material and dangerous waste training courses. The courses address waste management procedures, U.S. Department of Energy directives, Westinghouse Hanford policies, and federal and state regulations. The courses include the implementation of the applicable contingency plan and use of emergency and monitoring equipment.

8.1.2.1.13 Tank Farm Environmental Engineering Manager and Environmental Control Officer Training. The Tank Farm environmental engineering manager and environmental control officer complete specific courses in preparation for work assignments, including hazardous material and dangerous waste training courses. The courses address Tank Farm Project waste management procedures, U.S. Department of Energy directives, Westinghouse Hanford policies, and federal and state regulations. The courses include the implementation of the Tank Farm Project contingency plan and use of emergency and monitoring equipment.

8.1.2.1.14 Waste Operations Manager and Engineer Training. The waste operations manager and engineers complete specific courses in preparation for work assignments, including hazardous material and dangerous waste training courses. The courses address Tank Farm Project waste management procedures, U.S. Department of Energy directives, Westinghouse Hanford policies, and federal and state regulations. The courses include the implementation of the Tank Farm Project contingency plan and use of emergency and monitoring equipment.

8.1.2.1.15 Maintenance Manager, Maintenance Engineering Services Manager, and Maintenance Engineer Training. The maintenance manager, maintenance engineering services manager, and maintenance engineers complete specific courses in preparation for work assignments, including hazardous material and dangerous waste training courses. The courses address Tank Farm Project waste management procedures, U.S. Department of Energy directives, Westinghouse Hanford policies, and federal and state regulations. The courses include the implementation of the Tank Farm Project contingency plan, and use, inspection, repair, and replacement of emergency and monitoring equipment.

8.1.2.1.16 Craft Management Manager, Tank Farm Craft Maintenance, East Manager and Supervisor Training. The craft management manager, Tank Farm craft maintenance, East manager and supervisors complete specific courses in preparation for work assignments, including hazardous material and dangerous waste training courses. The courses address Tank Farm Project waste management procedures, U.S. Department of Energy directives, Westinghouse Hanford policies, and federal and state regulations. The courses include the implementation of the Tank Farm Project contingency plan and use, inspection, repair, and replacement of emergency and monitoring equipment.

8.1.2.1.17 Maintenance Crafts Training. The maintenance crafts complete specific courses in preparation for work assignments, including hazardous material and dangerous waste training courses. The courses address Tank Farm Project waste management procedures, U.S. Department of Energy directories, Westinghouse Hanford policies, and federal and state regulations. The courses include the implementation of the Tank Farm Project contingency plan and use, inspection, repair, and replacement of emergency and monitoring equipment.

8.1.2.1.18 Laboratory Manager Training. The laboratory manager completes specific courses in preparation for work assignments, including hazardous material and dangerous waste training courses. The courses address waste management procedures, U.S. Department of Energy directives, Westinghouse Hanford policies, and federal and state regulations. The courses include the implementation of the applicable contingency plan and use of emergency and monitoring equipment.

8.1.2.1.19 Chemist/Scientist Training. The chemists/scientists complete specific courses in preparation for work assignments, including hazardous material and dangerous waste training courses. The courses address waste management procedures, U.S. Department of Energy directives, Westinghouse Hanford policies, and federal and state regulations. The courses include the implementation of the applicable contingency plan and use of emergency and monitoring equipment.

8.1.2.1.20 Chemical Technologists Training. The chemical technologists complete specific courses in preparation for work assignments, including hazardous material and dangerous waste training courses. The courses address waste management procedures, U.S. Department of Energy directives, Westinghouse Hanford policies, and federal and state regulations. The courses include the implementation of the applicable contingency plan and use of emergency and monitoring equipment. Chemical technologists are required to be qualified for assigned jobs through a systematic process of procedure qualification based on assigned work.

8.1.2.1.21 Tank Farm Project Hazardous Material Coordinator Training. The Tank Farm hazardous material coordinators complete specific courses in preparation for work assignments, including hazardous material and dangerous waste training courses. The courses address Tank Farm Project waste management procedures, U.S. Department of Energy directives, Westinghouse Hanford policies, and federal and state regulations. The courses include the implementation of the Tank Farm Project contingency plan and use of emergency and monitoring equipment.

8.1.2.1.22 Hanford Fire Department Training. The Hanford Fire Department personnel complete specific courses in preparation for work assignments, including hazardous material and dangerous waste training courses. The courses address waste management procedures, U.S. Department of Energy directives, Westinghouse Hanford policies, and federal and state regulations. The courses include the implementation of the applicable contingency plan and use of emergency and monitoring equipment.

Hanford Fire Department firefighters meet requirements of the National Firefighters Protection Association [NFPA 472 and 1001 (1989)], 29 CFR 1910.1200 and 1910.120 (paragraph Q), and the Washington State requirements for emergency medical personnel response.

8.1.2.1.23 Nonessential Personnel Training. Westinghouse Hanford employees not identified as essential personnel and other U.S. Department of Energy-contractor personnel who must enter the Tank Farm Project areas are required to complete "Tank Farm Orientation" or must be escorted. Non-U.S. Department of Energy-contractor personnel must complete a security and safety orientation before working in or around the Tank Farm Project areas.

8.1.2.2 Training Matrix: Job Positions and Training. The Tank Farm Project training program encompasses company-general, plant-specific, and job-specific training courses. Tables 8-1 through 8-6 consist of matrices that relate job title to the individual training courses. The matrices indicate if the courses are introductory or continuing, and also whether the course is part of a certification program required for specific personnel or required only for new empl¬yees.

Some courses are introductory and must be completed one time only (often referred to as orientation); other introductory courses are the first course in a program. Continuing courses are those that must be repeated according to a specified frequency.

8.1.2.3 Training Course Descriptions. Appendix 8A contains brief descriptions of selected courses, including course descriptions, the target audience, instructional delivery, evaluation method, length of course, and frequency of retraining.

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8.1.3 Training Director [H-1c]

There is no one individual designated as training director at Westinghouse Hanford. This responsibility is shared among Tank Farm Project, Technical Training, Health Physics, Industrial Safety and Fire Protection, Process Engineering, and Laboratory Training. The distribution of training responsibilities at the Tank Farm Project is provided in Figure 8-1. Using the system noted in Figure 8-1, LERF management can access training resources and experts in many different areas of hazardous material, dangerous waste, and industrial safety, rather than relying on the knowledge of one person or a small number of individuals. General responsibilities for training are discussed in the following sections.

8.1.3.1 Tank Farm Project Management Responsibilities. Tank Farm Project management has the following responsibilities related to training:

- Establishing operations and maintenance training requirements
- Requesting and/or conducting training
- Maintaining field training records and certifications
- Tracking retraining.

8.1.3.2 Tank Farm Project Training Responsibilities. Tank Farm Project training has the following responsibilities related to training:

- Developing and providing study material and examinations
- Preparing and administering examinations
- Coordinating classes and other training requirements to complete and maintain certifications
- Developing and maintaining on-the-job training requirements.

8.1.3.3 Process Engineering Responsibilities. Process engineering has the following responsibilities related to training:

- Establishing process engineering training requirements
- Developing and conducting process engineering training
- Maintaining field training records and certifications
- Tracking retraining.

8.1.3.4 Technical Training Responsibilities. Organizations with technical training responsibilities are discussed in the following sections.

8.1.3.4.1 Technical Training Support and Accreditation. Technical training support and accreditation is responsible for the following:

- Conducting job analysis
- Operating and maintaining central training files
- Providing consultation to other training organizations regarding training development.

8.1.3.4.2 Safety and Environmental Training. Safety and environmental training is responsible for the following:

- Developing and implementing company-general training courses to comply with federal and state regulations
- Conducting hazardous material and dangerous waste handling courses
- Conducting safety training courses
- Developing and providing health physics technician classroom certification training
- Conducting radiation safety training courses
- Conducting respiratory protection classes.

8.1.3.4.3 Maintenance Training. Maintenance training is responsible for developing training materials and providing instruction for maintenance personnel.

8.1.3.5 Health Physics Training. Training responsibilities for the Health Physics organization include the following:

- Establishing health physics personnel training requirements
- Developing and conducting health physics on-the-job training
- Maintaining health physics technician field training records and certifications
- Tracking health physics technician retraining.

8.1.3.6 Industrial Safety and Fire Protection Responsibilities. Training responsibilities for this organization include the following:

- Maintaining current knowledge of Occupational Safety and Health Administration regulations

- Ensuring compliance with Occupational Safety and Health Administration regulations through audits, design and procedure reviews, and surveillances

- Providing instructions for selected safety classes

- Consulting with Technical Training and Tank Farm Project management in the development and reevaluation of current training programs.

8.1.3.7 Laboratory Training Responsibilities. Laboratory training responsibilities include the following:

- Establishing laboratory personnel training requirements

- Conducting laboratory on-the-job training

- Maintaining field training records and certifications

- Tracking retraining

- Providing instructors for selected safety classes

- Consulting with Technical Training and Tank Farm Project management in the developing and reevaluation of current training programs.

8.1.4 Relevance of Training to Job Position [H-1d]

The training program for the Tank Farm Project was developed after completing an initial job analysis. Tasks performed by the nuclear operators, shift supervisors, shift managers, shift operations manager, surveillance manager, and East Tank Farm surveillance supervisor were identified and evaluated to determine training requirements. In addition, training needs continually are assessed in relation to current federal and state regulations. These evaluations could result in modifying or adding new material to the current training program.

Certification is required for the Tank Farm Project surveillance manager, East Tank Farm surveillance supervisor, shift operations manager, shift managers, shift supervisors, and nuclear operators who work in Tank Farm Project Facility Operations. To become certified at the Tank Farm Project, an employee must successfully complete classroom training and on-the-job training. Classroom instruction is designed to provide employees with fundamental knowledge required to perform work safely within the Tank Farm Project.

On-the-job training requires operations personnel to gain experience with operating procedures. All work that involves hazardous material and dangerous waste is performed according to approved operating procedures; therefore, an understanding of procedures is crucial to ensure the proper and safe operation of the Tank Farm Project. Understanding is accomplished by having individuals perform, simulate, and/or describe a particular task as specified by the appropriate operating procedure. The individual demonstrating the required skills and knowledge is observed by another certified nuclear operator and by the appropriate Tank Farm Project Facility Operations shift operations manager, shift manager, shift supervisor, surveillance manager, or East Tank Farm surveillance supervisor before being certified.

Additionally, management must complete their own certification requirements, which include self-study and on-the-job training.

8.1.5 Training to Emergency Response [H-1e]

Effective response to emergencies, and familiarity with emergency equipment and emergency systems, are covered under the classroom and on-the-job training requirements as outlined in Tables 8-1, 8-2, 8-3, 8-4, 8-5, 8-6, and Appendix 8A.

Federal and state regulations require that personnel be able to respond effectively to emergencies and that personnel be familiar with emergency procedures, emergency equipment, and emergency systems. Specific topics addressed include the following:

- Tank Farm orientation
- Plant-specific training
- Tank Farm nuclear operator emergency procedures and abnormal plant conditions training
- Tank Farm process operations manager emergency procedures and abnormal plant conditions training
- Tank Farm process engineering emergency procedures and abnormal plant conditions training
- Tank Farm health physics technician emergency procedures and abnormal plant conditions training
- Tank Farm maintenance emergency procedures and abnormal plant conditions training.

8.2 IMPLEMENTATION OF TRAINING PROGRAM [H-2]

The Tank Farm Project training program is in place and has been fully implemented. Certification for the Tank Farm Project is required before working without supervision. Certification requires personnel to successfully complete identified classroom and on-the-job training requirements. Certification requires management to successfully complete self-study, classroom, and on-the-job training requirements. Training content is reviewed and updated as appropriate.

Training of new employees is to be completed within the first 6 months. After the initial training, employees are required to recertify annually. Uncertified employees are not permitted to work in the Tank Farm Project without the supervision of a certified employee. The appropriate Tank Farm Project Facility Operations shift operations manager and surveillance manager are responsible for ensuring new employees are trained and certifications are maintained.

Official training record files for Tank Farm Project employees are stored in the Training Records Information System. This database is managed by the Technical Training Records organization. Technical Training Records inputs the completed training records into a computer file. The computer file is accessible on a local area network to allow remote accessing of employee training records via a computer terminal. A tickler file is available from the database to inform the appropriate Tank Farm Project Facility Operations shift operations manager and surveillance manager when training is within 90 days of expiration. A copy of completed training and certifications for Tank Farm Project employees is available at the Tank Farm Project training organization. All training records are maintained for a period of 3 years for all personnel who leave Westinghouse Hanford.

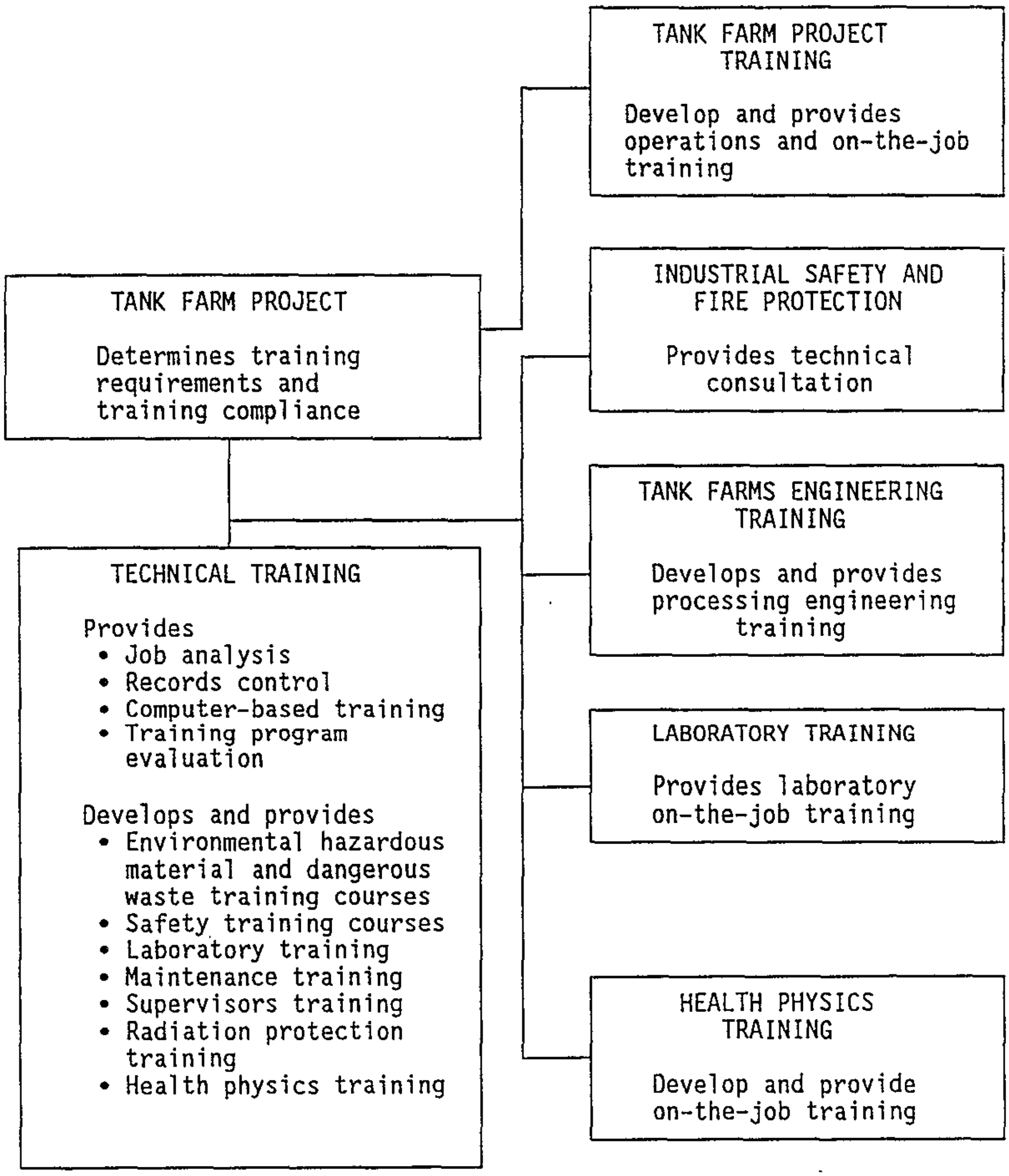

Figure 8-1. Distribution of Responsibility for Tank Farm Project Training.

Table 8-1. Company-General Training Matrix.

Course	Type	Target Audience																
		PM	PO	OM	NO	MM	CM	PE	PC	HP	HPT	LM	CT	QA	QC	SF	HZ	FD
Radiation safety training	I	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Radiation safety requalification	C	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Hanford Site general employee training	C	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
New employee safety training	I	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
On-the-job training instructor training	I	-	-	3	3	3	3	-	3	3	3	3	3	-	3	-	-	-
Environmental and hazardous material safety training requirements (Tables 8-5, 8-6)	I,C	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Building emergency director training	C	-	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Basic crane and rigging training	C	-	-	-	-	X	X	-	-	-	-	-	-	-	-	-	-	-
Orientation to DOE Order 5000.3A occurrence reporting	I	X	X	X	X	X	-	X	X	X	-	X	-	X	X	X	X	-
Managers, first line managers conduct of operations, DOE Order 5480.19	I	X	X	X	-	X	-	X	X	X	-	X	-	X	X	X	X	-

Target audience abbreviations				Legend	
PM	Tank Farm Project director and deputy director	HPT	Health physics technician	I	Introductory course
PO	Facility Operations manager and East/West Tank Farm operations managers	LM	Laboratory manager and chemists/scientists	C	Continuing course
OM	Shift operations manager, shift managers, shift supervisors, surveillance manager, and East Tank Farm surveillance supervisor	CT	Chemical technologists	X	Required course
NO	Nuclear operators	QA	Quality assurance manager and engineers	-	Not applicable

Target audience abbreviations				Legend	
MM	Maintenance manager, maintenance engineering services manager, craft management manager, Tank Farm craft maintenance, East manager, supervisors, and engineers	QC	Quality control manager and inspectors	1	Completed as part of job-specific certification
CM	Maintenance craft	SF	Industrial safety manager and engineers	2	Required only for new employees
PE	Plant engineering manager, East cognizant engineering manager, and engineers	HZ	Tank Farm environmental engineering manager and environmental control officer, waste operations manager and engineer, and hazardous material coordinators	3	Required as determined by management for designated personnel
PC	Process engineering manager, East process engineering manager, and engineers	FD	Hanford Fire Department		
HP	Health Physics supervisor				

Table 8-2. Plant-Specific Training Matrix.

Course	Type	Target Audience																
		PM	PO	OM	NO	MM	CM	PE	PC	HP	HPT	LM	CT	QA	QC	SF	HZ	FD
Orientation - Tank Farm*	I	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Building emergency plan checklist	C	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Tank Farms plant-specific occurrence reporting	I	X	X	X	X	X	-	X	X	X	-	-	-	-	-	-	-	-

Target audience abbreviations			
PM	Tank Farm project director and deputy director	HPT	Health physics technician
PO	Facility Operations manager and East/West Tank Farm operations managers	LM	Laboratory manager and chemists/scientists
OM	Shift operations manager, shift managers, shift supervisors, surveillance manager, and East Tank Farm surveillance supervisor	CT	Chemical technologists
NO	Nuclear operators	QA	Quality assurance manager and engineers
MM	Maintenance manager, maintenance engineering services manager, craft management manager, Tank Farm craft maintenance, East manager, supervisors, and engineers	QC	Quality control manager and inspectors
CM	Maintenance craft	SF	Industrial safety manager and engineers
PE	Plant engineering manager, East cognizant engineering manager, and engineers	HZ	Tank Farm environmental engineering manager and environmental control officer, waste operations manager and engineer, and hazardous material coordinators
PC	Process engineering manager, East process engineering manager, and engineers	FD	Hanford Fire Department
HP	Health Physics supervisor		

Legend	
I	Introductory course
C	Continuing course
X	Required course
-	Not applicable
4	Required only for personnel assigned to unit
*	All other Westinghouse Hanford personnel in a supporting capacity, other than visitors, must complete this course

Table 8-3. Job-Specific Training Matrix. (sheet 1 of 3)

Course	Type	Target Audience																
		PM	PO	OM	NO	MM	CM	PE	PC	HP	HPT	LM	CT	QA	QC	SF	HZ	FD
General radio-chemical operator training	C	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Farm processes and services plant-specific training	C	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-
Nuclear operator certifications	C	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Farm operator certification-Routines	C	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Farm operator certification-Surveillance liquid-level monitoring	C	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Farm nuclear operator emergency procedures and abnormal plant conditions training	C	-	-	-	X[b]	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Farm certification-process operations manager	C	-	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Farm operational safety requirement	C	X	X	X	X	X	X	X	X	-	-	-	-	X	-	-	-	-
Tank Farm conduct of operations	C	X	X	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Farm process operations manager emergency procedures and abnormal plant conditions training	C	-	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phase I process engineering certification (site-generic training)	I	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-
Phase II process engineering certification (plant-specific training)	C	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-
Phase III process engineering certification (process-specific training)	C	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-
Tank Farm process engineering emergency procedures and abnormal plant conditions training	C	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-

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Table 8-3. Job-Specific Training Matrix. (sheet 2 of 3)

Course	Type	Target Audience																
		PM	PO	OM	NO	MM	CM	PE	PC	HP	HPT	LM	CT	QA	QC	SF	HZ	FD
Tank Farm maintenance emergency procedures and abnormal plant conditions training	C	-	-	-	-	X	X	-	-	-	-	-	-	-	-	-	-	-
Chemical technologist qualification	C	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-
Health physics technician-trainee certification	I	-	-	-	-	-	-	-	-	-	X[c]	-	-	-	-	-	-	-
Health physics technician-trainee general on-the-job training	C	-	-	-	-	-	-	-	-	-	X[d]	-	-	-	-	-	-	-
Health physics technician-trainee Tank Farm on-the-job training	C	-	-	-	-	-	-	-	-	-	X[d]	-	-	-	-	-	-	-
Health physics technician certification	C	-	-	-	-	-	-	-	-	-	X[e]	-	-	-	-	-	-	-
Health physics technician general on-the-job training	C	-	-	-	-	-	-	-	-	-	X[f]	-	-	-	-	-	-	-
Health physics technician Tank Farm on-the-job training	C	-	-	-	-	-	-	-	-	-	X[f]	-	-	-	-	-	-	-
Senior health physics technician certification	C	-	-	-	-	-	-	-	-	-	X[g]	-	-	-	-	-	-	-
Senior health physics technician general on-the-job training	C	-	-	-	-	-	-	-	-	-	X[g]	-	-	-	-	-	-	-
Senior health physics technician Tank Farm on-the-job training	C	-	-	-	-	-	-	-	-	-	X[g]	-	-	-	-	-	-	-
Tank Farm health physics technicians emergency procedures and abnormal plant conditions training	C	-	-	-	-	-	-	-	-	-	X[h]	-	-	-	-	-	-	-

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Table 8-3. Job-Specific Training Matrix. (sheet 3 of 3)

Target audience abbreviations				Legend	
PM	Tank Farm project director and deputy director	HPT	Health physics technician	I	Introductory course
PO	Facility Operations manager and East/West Tank Farm operations managers	LM	Laboratory manager and chemists/scientists	C	Continuing course
OM	Shift operations manager, shift managers, shift supervisors, surveillance manager, and East Tank Farm surveillance supervisor	CT	Chemical technologists	X	Required course
NO	Nuclear operators	QA	Quality assurance manager and engineers	X^a	Required for shift supervisors designated by Facility Operations management
MM	Maintenance manager, maintenance engineering services manager, craft management manager, Tank Farm craft maintenance, East manager, supervisors, and engineers	QC	Quality control manager and inspectors	X^b	Nuclear process operations must complete this course in alternating years in conjunction with the general radio-chemical operator
CM	Maintenance craft	SF	Industrial safety manager and engineers	X^c	Required only for those health physics technicians hired into the company at the junior health physics technician level
PE	Plant engineering manager, East cognizant engineering manager, and engineers	HZ	Tank Farm environmental engineering manager and environmental control officer, waste operations manager and engineer, and hazardous material coordinators	X^d	Required for junior health physics technicians, health physics technicians, and senior health physics technicians
PC	Process engineering manager, East process engineering manager, and engineers	FD	Hanford Fire Department	X^e	Required only for health physics technicians hired into the company at the health physics technician level or who progress from the junior health physics technician level
HP	Health Physics supervisor			X^f	Required for health physics technicians and senior health physics technicians
				X^g	Required for senior health physics technicians only
				X^h	Required for health physics technician-trainees, health physics technicians, and senior health physics technicians

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Table 8-4. Special Training Matrices.

Course	Type	Special company target audience
		Onsite contractor personnel other than Westinghouse Hanford Company
Non-DOE contractor orientation	I	X

I = Introductory course
X = Course required

Table 8-5. Environmental and Hazardous Material Safety Initial Training Matrix.

Employee Category [a]	Course Title														Total Hours
	Hazardous Co_munication and Waste Orientation (1 hour)	Generator Hazards Safety Training (4 hours)	Hazardous Materials Waste Job-Specific Training [b]	Radiation Worker Training (8 hours)	Waste Site-Basic (16 hours)	Scott SKA-PAK [c] Training (2 hours)	Cardiopulmonary Resuscitation (4 hours)	Fire Extinguisher Safety (1 hour)	Waste Site Advanced (24 hours)	Waste Site Field Experience (24 hours)	Hazardous Waste Shipment Certification (24 hours)	Certification of Hazardous Material Shipments (8 hours)	Hazardous Waste Site Supervisor/Manager (8 hours)	Compliance Category [d]	
1. All Employees	X														1
2. General Worker		X	X											1	5 + unit-specific training
3. General Supervisor/ Manager		X	X											1	5 + unit-specific training
4. General Nonradiological Shipper		X	X								X			1,2	29 + unit-specific training
5. General Hazardous Material Shipper		X	X									X		1,2	13 + unit-specific training
6a. Hazardous Waste Worker (known hazards)		X	X	X	X									1,3	28 + unit-specific training + field experience
6b. Hazardous Waste Worker (unknown hazards)		X	X	X		X	X	X	X	X				1,4	44 + unit-specific training + field experience
7. Hazardous Waste Supervisor/Manager		X	X	X		X	X	X	X	X			X	1,5	52 + unit-specific training + field experience
8. Hazardous Waste Shipper		X	X	X		X	X	X	X	X	X	X		1,2,4	76 + unit-specific training + field experience

H9008028.1C

[a] Category definitions are in Table 8-7.

[b] Length varies for each waste management unit.

[c] Scott SKA-PAK is a trademark of Figgie International, Incorporated.

[d] Compliance categories:

1 WAC 173-303, 29 CFR 1910.1200
2 49 CFR 173
3 29 CFR 1910.120 (24-hour requirement)
4 29 CFR 1910.120 (40-hour requirement)
5 29 CFR 1910.120 (40-hour plus 8-hour requirement)

Table 8-6. Environmental and Hazardous Material Safety Retraining Matrix.

Employee Category[a]	Course Title (length/frequency)				
	Generator Hazards Safety Training (4 hours/2 years)	Hazardous Materials Waste Job-Specific Training (1 year)[b]	Hazardous Waste Site Retraining (8 hours/1 year)	Hazardous Waste Shipment Certification (24 hours/1 year)	Certification of Hazardous Material Shipments (8 hours/2 years)
1. All Employees		Not Required			
2. General Worker	X	X			
3. General Supervisor/Manager	X	X			
4. General Nonradiological Shipper	X	X		X	
5. General Hazardous Material Shipper	X	X			X
6a. Hazardous Waste Worker (known hazards)	X	X	X		
6b. Hazardous Waste Worker (unknown hazards)	X	X	X		
7. Hazardous Waste Supervisor/Manager	X	X	X		
8. Hazardous Waste Shipper	X	X	X	X	X

H9008028.2B

[a] Category definitions are in Table 8-7.
[b] Length varies for each unit.

1

2 Table 8-7. Employee Work Categories Definitions. (sheet 1 of 2)

		Employee category	Definition
3		Employee category	Definition
4	1.	All employees	All Westinghouse Hanford Employees and unescorted contract personnel.
5	2.	General worker	Any employee who is or has the potential to be exposed to hazardous chemicals in the work place. Also, any employee who generates, packages, stores, or ships hazardous waste or who directly affects the management of hazardous chemicals or hazardous waste.
6	3.	General Supervisor or Manager	Supervisor or manager who qualifies under the definition of General Worker (No. 2) or who has subordinates who qualify as general workers.
7	4.	General Nonradiological Dangerous Waste Shippers	Employees who are responsible for preparing and signing the Uniform Hazardous Waste Manifests.
8	5.	General Hazardous Material (Radiological) Shippers	Employees who certify the compliance of radioactive Hanford Site hazardous material shipments.

9 Categories 6 through 8 as defined in OSHA 29 CFR 1910.120 *Hazardous Waste*
10 *Operations and Emergency Response*, are as follows:

11	6a.	Hazardous Waste Site Worker - hazards known	Employees who work within or require entry into RCRA permitted portions of hazardous waste treatment, storage, or disposal (TSD) facilities.
12			Examples at the Hanford Site: PUREX aqueous makeup; PUREX sampling gallery; PUREX operating and pipe gallery.
13	6b.	Hazardous Waste Site Worker - hazards unknown	Employees who work within or require entry into CERCLA/RCRA remediation sites or units where cleanup work may present unknown hazards or where there is potential for conditions to change and present unknown hazards.

Table 8-7. Employee Work Categories Definitions. (sheet 2 of 2)

	Employee category	Definition
1		Examples at the Hanford Site: Decontamination and decommissioning work/operations; Tank Farms; Grout Treatment Facility; crib/ditch/pond work including, but not limited to, the following; characterization, monitoring, sampling, and maintenance.
2	7. Hazardous Waste Site Supervisor or Manager	Supervisors or managers who oversee work of employees who qualify as Hazardous Waste Site Workers (Nos. 6a and 6b).
3	8. Hazardous Waste Site Shipper	Employees who are responsible for certifying shipments of nonradioactive hazardous waste, hazardous and radioactive material, and/or mixed waste.

4

APPENDIX 8A

TRAINING COURSE DESCRIPTIONS

APPENDIX 8A

CONTENTS

APPENDIX 8A

TRAINING COURSE DESCRIPTIONS

8A.1 COMPANY GENERAL COURSES	
Title	Radiation Safety Training
Description	Course instructs radiation workers in the fundamentals of radiation protection and the proper procedures for monitoring exposures.
Target audience	Radiation workers
Delivery	Classroom
Evaluation	Written test and practical dress/undress exercise
Length	7 hours
Frequency	24 months by completion of radiation safety
Title	Radiation Safety Requalification
Description	Course instructs radiation workers in the fundamentals of radiation protection and the proper procedures for monitoring exposures.
Target audience	Radiation workers
Delivery	Classroom or computer-based training
Evaluation	Written test and practical dress/undress exercise
Length	7 hours
Frequency	24 months

Title	New Employee Safety Training
Description	Course covers U.S. Department of Energy and Westinghouse Hanford regulations pertaining to employer and employee rights and responsibilities, general radiation training, hazardous waste, fire prevention, personal protective equipment, safety regulations, accident reporting, and avenues for addressing safety concerns.
Target audience	All new employees
Delivery	Classroom
Evaluation	Not applicable
Length	3 hours
Frequency	Not applicable

Title	Hanford General Employee Training
Description	Course covers U.S. Department of Energy and Westinghouse Hanford regulations pertaining to employer and employee rights and responsibilities, general radiation training, hazardous communications and hazardous waste, fire prevention, personal protective equipment, safety regulations, accident reporting, and avenues for addressing safety concerns.
Target audience	All employees
Delivery	Computer-based training/interactive video
Evaluation	Computer generated questions
Length	4-6 hours
Frequency	12 months

Title	On-the-Job Training Instructor Training
Description	Instructional approach to the planning, implementation, and evaluation of on-the-job training. Includes role-model demonstration exercise and practice with critique.
Target audience	Identified bargaining unit, exempt personnel
Delivery	Classroom
Evaluation	Practical exercise
Length	12 hours
Frequency	Not applicable

Title	Building Emergency Director Training
Description	Course provides an overview of building emergency director responsibilities, identifies the building emergency organizations, reviews building emergency plan, and discusses drill and exercise requirements.
Target audience	Primary and alternate building emergency directors and members of a building emergency organization
Delivery	Classroom
Evaluation	Written test
Length	2 hours
Frequency	12 months

Title	Basic Crane and Rigging Training
Description	Course is designed to familiarize those who operate any type of lifting device who are not professional crane operators. The content includes principles of rigging and lifting as well as safety checks and practices.
Target audience	Anyone who operates a lifting device
Delivery	Classroom
Evaluation	Written test
Length	Average = 8 hours
Frequency	24 months

Title	Orientation to U.S. Department of Energy Order 5000.3A Occurrence Reporting
Description	Course is designed to familiarize personnel with the new U.S. Department of Energy Order 5000.3A *Occurrence Reporting and Processing of Operations Information*. Course provides information on Order requirements and the changes made to occurrence reporting and processing of operational information.
Target audience	Personnel involved in occurrence reporting
Delivery	Classroom
Evaluation	Not applicable
Length	1.5 hours
Frequency	Not applicable

Title	Managers Conduct of Operations
Description	In depth discussion of DOE Order 5480.19, conduct of operations requirements for DOE facilities, and application of facilities.
Target audience	Management
Delivery	Classroom
Evaluation	Not applicable
Length	16 hours
Frequency	Not applicable

Title	First Line Managers Conduct of Operations
Description	In depth discussion of DOE Order 5480.19, conduct of operations requirements for DOE facilities, and application at facilities plus practical facility walkthrough.
Target audience	Management
Delivery	Classroom and walkthrough facility
Evaluation	Not applicable
Length	24 hours
Frequency	Not applicable

8A.2 PLANT-SPECIFIC COURSES

Title	Orientation--Tank Farms
Description	Course consists of employees being made aware of the type of radiation found in their work areas and instruments used to detect radiation. Radiation signs and radiation work permits are discussed.
Target audience	All personnel assigned to or performing work in the Tank Farms
Delivery	Classroom
Evaluation	Not applicable
Length	1 hour
Frequency	Not applicable

Title	Building Emergency Plan Checklist
Description	Course provides the information managers are required to discuss with employees. The checklist is contained in the building emergency plan. The building emergency plan covers designated Tank Farms buildings.
Target audience	All Tank Farms employees, including contractor personnel.
Delivery	Classroom
Evaluation	Not applicable
Length	Average = 2 hours
Frequency	12 months

Title	Tank Farms Plant-Specific Occurrence Reporting
Description	Occurrence reporting for plant specifics.
Target audience	Nuclear operators, operations and management personnel
Delivery	Classroom
Evaluation	Not applicable
Length	1 hour
Frequency	Not applicable

1	8A.3 JOB-SPECIFIC COURSES	
2	Title	General Radio-Chemical Operator Training
3	Description	Course consists of self-study, using a manual that covers, in general terms, the following topics for 200 Areas processing and waste management units: • Introduction • Mathematics • Chemistry • Security • Industrial safety • Emergency preparedness • Radiation safety • Environmental protection • Criticality prevention • Nuclear materials management • Instrumentation • Process and equipment.
4	Target audience	Nuclear operators (i.e., operator trainee, 18-month nuclear operator, 30-month nuclear operator, 42-month nuclear operator, and nuclear process operator) process crane operators, dispatchers, and Tank Farms shift operations managers
5	Delivery	Classroom or self-study
6	Evaluation	Written test
7	Length	Average = 80 hours
8	Frequency	12 months for operator trainee through nuclear operator 42-month levels; 24 months for nuclear process operator level; not applicable for Tank Farms shift operations managers
9		

1	Title	Tank Farms Processes and Services Plant-Specific Training
2	Description	Course is designed to establish a general understanding and comprehension of the Tank Farms operation and process for operation personnel.
3	Target audience	Nuclear operators, including process crane operators, assigned to the Tank Farms (i.e., operator trainee, 18-month nuclear operator, 30-month nuclear operator, 42-month nuclear operator, and nuclear process operator)
4	Delivery	Self-study and on-the-job training
5	Evaluation	Written test and on-the-job training checklist
6	Length	Average = 80 hours
7	Frequency	12 months for operator trainee through 42-month nuclear operator level; 24 months for nuclear process operator level
8		
9	Title	Tank Farms Nuclear Operator Certifications
10	Description	Courses are designed to prepare and certify Tank Farms nuclear operators to operate the Tank Farms. Operations managers and supervisors will complete courses designated by management. Courses will be designed, developed, implemented, and documented based on job and training analyses.
11	Target audience	Nuclear operators assigned to the Tank Farms and Tank Farms operations managers and supervisors
12	Delivery	Classroom, self-study, and on-the-job training
13	Evaluation	Written test and on-the-job training checklist
14	Length	Average = 200 hours
15	Frequency	24 months
16		

Title	Tank Farms Operator Certification--Routines
Description	Course defines surveillance of Tank Farms operations.
Target audience	Nuclear operators
Delivery	Self-study and on-the-job training
Evaluation	Written test
Length	Average = 200 hours
Frequency	24 months

Title	Tank Farms Operator Certification--Surveillance Liquid-Level Monitoring
Description	Course covers certification requirements for liquid-level monitoring.
Target audience	Nuclear operators
Delivery	Self-study and on-the-job training
Evaluation	Written test
Length	Average = 200 hours
Frequency	24 months

Title	Tank Farms Nuclear Process Operator Emergency Procedures and Abnormal Plant Conditions Training
Description	Course consists of a review of abnormal and emergency conditions that could occur in the Tank Farms, associated alarms and communications, and proper responses.
Target audience	Nuclear process operators, beginning 12 months after completion of general radio-chemical operator and plant specific training
Delivery	Self-study and on-the-job training
Evaluation	Written test
Length	Average = 20 hours
Frequency	12 months
SPECIAL NOTE: To comply with the U.S. Department of Energy training requirement for nonreactor nuclear facility operations personnel, nuclear process operators must complete emergency training at least annually. This course must be completed by nuclear operators at the nuclear process operator level in conjunction with the general radio-chemical operator and plant-specific requalification courses. To achieve this, the requalification courses will be completed one year, the emergency procedures and abnormal plant conditions training the next year, then the requalification courses, then the emergency procedures and abnormal plant conditions training, etc. In this way, nuclear process operators complete annual emergency training.	

Title	Tank Farms Process Operations Manager Certification
Description	Course covers the following topics: • Administrative information • Technical information • Safety analysis reports • Operational safety requirements • Radiation work procedures • Jobs conducted in the area of assigned responsibility • Processes and services • Equipment.
Target audience	Operations managers and supervisors
Delivery	Self-study and on-the-job training
Evaluation	Written test and on-the-job training checklist
Length	Average = 80 hours
Frequency	24 months

Title	Tank Farms Operational Safety Requirements Training
Description	Course defines to plant personnel specific operational safety requirements, related procedural limits, instrumentation used to monitor the limits, and the data sheets used to document continued compliance with these controls.
Target audience	General, safety, quality assurance, operations, nuclear operators, management, maintenance, and engineering personnel
Delivery	Classroom
Evaluation	Not applicable
Length	2 hours
Frequency	24 months

Title	Tank Farms Conduct of Operations
Description	Course provides guidelines to ensure all Tank Farms operations are conducted in an effective, consistent manner in accordance with applicable Westinghouse Hanford policies, plant procedures, and U.S. Department of Energy regulations.
Target audience	Nuclear operators and operations personnel
Delivery	Classroom
Evaluation	Not applicable
Length	Average = 1 hour
Frequency	24 months

Title	Tank Farms Process Operations Manager Emergency Procedures and Abnormal Plant Conditions Training
Description	Course is designed to be a review of abnormal and emergency conditions that could occur in Tank Farms, associated alarms and communications, and proper responses: • General • Plant • Processes and services • Equipment.
Target audience	Operations managers and supervisors
Delivery	Self-study and on-the-job training
Evaluation	Written test
Length	Average = 20 hours
Frequency	12 months

Title	Phase I Process Engineering Certification (Site-Generic Training)
Description	Phase I training covers general information about nuclear processing operations. The following topics are covered: • Radiological controls • Accident prevention standards • Company policies • Environmental protection • Packaging and shipping hazardous materials and radioactive waste • Engineering procedures (configuration control, operating document control, and design media control) • Selected quality assurance procedures.
Target audience	Process engineers
Evaluation	Written test
Length	Average = 20 hours
Frequency	Not applicable

1	Title	Phase II Process Engineering Certification (Plant-Specific) Training
2	Description	Phase II training covers generic information for a specific operating unit. The following topics are covered: • Plant processes • Plant utilities.
3	Target audience	Process engineers
4	Delivery	Self-study
5	Evaluation	Written test and oral walkthrough
6	Length	Average = 40 hours
7	Frequency	24 months
8		
9	Title	Phase III Process Engineering Certification (Process-Specific Training)
10	Description	Phase III training covers detailed information on 'specialized' areas within a given unit, in this case the information is determined based on job and training analyses. Topics covered include details of the following: • Process flowsheet • Operating specifications • Process equipment • Operating procedures.
11	Target audience	Process engineers
12	Delivery	Self-study
13	Evaluation	Written test or oral walkthrough
14	Length	Average = 40 hours
15	Frequency	24 months
16		

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1	Title	Tank Farm Process Engineering Emergency Procedures and Abnormal Conditions Training
2	Description	Course is designed to prepare engineers to be able to recognize abnormal and emergency conditions that might occur in the Tank Farms, associated alarms and communications, and proper responses. The following topics are presented: • Emergency procedures • Abnormal conditions and responses • Tank Farms status • Criticality prevention standards • Desk instructions • Tank Farms/assigned area familiarity • Operating procedures and documentation • Unusual/off-normal documentation.
3	Target audience	Process engineers
4	Delivery	Self-study
5	Evaluation	Written test
6	Length	Average = 20 hours
7	Frequency	12 months
8		
9	Title	Tank Farms Maintenance Emergency Procedures and Abnormal Conditions Training
10	Description	Course is designed to be a review of abnormal and emergency conditions that could occur in the Tank Farms, associated alarms and communications, and proper responses: • General • Plant • Equipment.
11	Target audience	Maintenance personnel
12	Delivery	Self-study and on-the-job training
13	Evaluation	Written test
14	Length	Average = 20 hours
15	Frequency	12 months
16		

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Title	Chemical Technologist Qualification
Description	Course includes tasks based on job and procedures.
Target audience	Chemical technologists
Delivery	Classroom and on-the-job training
Evaluation	Examination and on-the-job training checklist
Length	Average = 20 hours
Frequency	12 months

Title	Health Physics Technician-Trainee Certification
Description	Course consists of the following topics: • Academics • Radiation protection practices • Emergency response • Radiation safety • Criticality safety • Industrial safety • Practical exercises - Dress/undress - Establishing radiation areas and control points - Surveying radiation generating machines - Release surveying - Estimating exposure - Detailed radiological survey.
Target audience	Health physics technician-trainee
Delivery	Classroom
Evaluation	Written test
Length	Average = 170 hours
Frequency	Not applicable. The health physics technician-trainee must complete the Health Physics Technician Certification within 15 to 18 months of this course completion, including on-the-job training courses.

1	Title	Health Physics Technician-Trainee General On-the-Job Training
2	Description	Course includes the following topics: • Manuals • Records and reports • Exposure control - Dosimetry - Survey techniques • Instrumentation • Qualitative respirator fit • Routine radiological control • Job planning - Radiological postings - Hazards analysis • Abnormal conditions and emergencies - Criticality - Radiation area injuries - Personnel decontamination - Radioactive spills - Area evacuation - Continuous alarm monitor alarm response.
3	Target audience	Health physics technician-trainee
4	Delivery	On-the-job training
5	Evaluation	On-the-job training checklist
6	Length	Average = 200 hours
7	Frequency	24 months
8		
9	Title	Health Physics Technician-Trainee Tank Farms On-the-Job Training
10	Description	Course includes the following tasks: • Decontamination and decommissioning • General monitoring and applicable routines • Isolation and stabilization monitoring • High-efficiency particulate air filter change • Construction coverage • Routine coverage.
11	Target audience	Health Physics Technician-Trainee
12	Delivery	On-the-job training
13	Evaluation	On-the-job training checklist
14	Length	Average = 200 hours
15	Frequency	24 months
16		

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1	Title	Health Physics Technician Certification
2	Description	Course includes the following topics: • Academics • Radiation protection practices • Radiological work planning and briefing • Radiation safety • Criticality safety • Emergency response • Practical exercise - radiation detection instrumentation.
3	Target audience	Health physics technician
4	Delivery	Classroom
5	Evaluation	Written test
6	Length	Average = 168 hours
7	Frequency	Not applicable. The health physics technician must complete the Senior Health Physics Technical Certification within 15 to 18 months of this course completion, including on-the-job training.
8		

1	Title	Health Physics Technician General On-the-Job Training
2	Description	Course includes the following topics: • Manuals • Records and reports • Exposure control - Dosimetry - Survey techniques • Instrumentation • Qualitative respirator fit • Routine radiological control • Job planning - Radiological postings - Hazards analysis • Abnormal conditions and emergencies - Criticality - Radiation area injuries - Personnel decontamination - Radioactive spills - Area evacuation - Continuous alarm monitor alarm response.
3	Target audience	Health physics technician
4	Delivery	On-the-job training
5	Evaluation	On-the-job training checklist
6	Length	Average = 200 hours
7	Frequency	24 months
8		

9	Title	Health Physics Technician-Tank Farms On-the-Job Training
10	Description	Course includes the following tasks: • Decontamination and decommissioning • General monitoring and applicable routines • Isolation and stabilization monitoring • High-efficiency particulate air filter change • Construction coverage • Routine coverage.
11	Target audience	Health physics technicians
12	Delivery	On-the-job training
13	Evaluation	On-the-job training checklist
14	Length	Average = 200 hours
15	Frequency	24 months
16		

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1	Title	Senior Health Physics Technician Certification
2	Description	Course consists of the following topics: • Academics • Radiation protection practices • Emergency response • Radiation safety • Criticality safety • Radiological problem solving • Practical exercises.
3	Target audience	Senior health physics technician
4	Delivery	Classroom
5	Evaluation	Written test
6	Length	Average = 168 hours
7	Frequency	24 months
8		

9	Title	Senior Health Physics Technician General On-the-Job Training

10	Description	Course includes the following topics:
		• Manuals
		• Records and reports
		• Exposure control
		  - Dosimetry
		  - Survey techniques
		• Instrumentation
		• Qualitative respirator fit
		• Routine radiological control
		• Job planning
		  - Radiological postings
		  - Hazards analysis
		• Abnormal conditions and emergencies
		  - Criticality
		  - Radiation area injuries
		  - Personnel decontamination
		  - Radioactive spills
		  - Area evacuation
		  - Continuous alarm monitor alarm response.

11	Target audience	Senior health physics technician
12	Delivery	On-the-job training General on-the-job training
13	Evaluation	On-the-job training checklist
14	Length	Average = 200 hours
15	Frequency	24 months
16		

Title	Senior Health Physics Technician Tank Farms On-the-Job Training
Description	Course includes the following tasks: • Decontamination and decommissioning • General monitoring and applicable routines • Isolation and stabilization monitoring • High-efficiency particulate air filter change • Construction coverage • Routine coverage.
Target audience	Senior health physics technicians
Delivery	On-the-job training
Evaluation	On-the-job training checklist
Length	Average = 200 hours
Frequency	24 months

Title	Health Physics Technicians (All) On-the-Job Training--Emergency Procedures and Abnormal Plant Conditions
Description	Course consists of the following topics and alternates from year to year between classroom training and testing, on-the-job training, and on-the-job training checklist: • Continuous air monitor alarm • Contamination spread • Personnel decontamination • Criticality alarm • Chemical spill or problem • General emergencies (e.g., fire).
Target audience	Health physics technician-trainee, health physics technician, senior health physics technician
Delivery	Classroom or on-the-job training
Evaluation	Written test or on-the-job training checklist
Length	Average = 16 hours
Frequency	12 months

8A.4 ENVIRONMENTAL AND HAZARDOUS MATERIAL SAFETY TRAINING

	Course name	Description
1.	Hazard Communication and Waste Orientation	Course provides an overview of the federal and Westinghouse Hanford hazard communication programs and hazardous waste disposal programs.
2.	Generator Hazards Safety Training	Course provides the hazardous material/waste worker with the fundamentals for use and disposal of hazardous materials.
3.	Hazardous Materials/Waste Job-Specific Training	Course provides specific information on hazardous chemicals and waste management at the employees' waste management unit.
4.	Initial Radiation Worker Training	Course provides radiation workers with the fundamentals of radiation protection and the proper procedures for maintaining exposures as low as reasonably achievable.
5.	Waste Site-Basics	Course provides required information for the safe operation of hazardous waste treatment, storage, and/or disposal facilities regulated under 40 CFR 264 and 265 pursuant to RCRA.
6.	Scott 'SKA-PAK'* Training-SKA	Course instructs employees in the proper use of the Scott 'SKA-PAK' for entry, exit, or work in conditions 'immediately dangerous to life and health' and instructs employees to recognize and handle emergencies.
7.	Cardiopulmonary Resuscitation	Course of the American Heart Association that provides certification in cardiopulmonary resuscitation for the single rescuer (Heartsaver Course).
8.	Fire Extinguisher Safety	Course provides videocassette presentation that covers types of portable fire extinguishers and the proper usage for each.

*Scott SKA-PAK is a trademark of Figgie International, Incorporated.

	Course name	Description
9.	Waste Site-Advanced	Course provides environmental safety information for RCRA and/or CERCLA operations and sites. Topics include regulations and acronyms, occupational health and safety, chemical hazard information, toxicology, personal protective equipment and respirators, site safety, decontamination, and chemical monitoring instrumentation.
10.	Waste Site Field Experience	Course is a 3-day field experience under the direct supervision of a trained, experienced supervisor.
11.	Hazardous Waste Shipment Certification	Course provides an indepth look at federal, state, and company requirements for nonradioactive hazardous waste management and transportation.
12.	Certification of Hazardous Material Shipments	Course provides training in hazardous material regulation of the U.S. Department of Transportation, as required by law, to those who certify the compliance of Hanford Site hazardous material shipments. The main focus is on the proper preparation and release of radioactive material shipments.
13.	Hazardous Waste Site Supervisor/Manager	Course provides specialized training to operations and site management in the following Westinghouse Hanford programs: safety and health, employee training, personal protective equipment, spill containment, and health hazard monitoring procedures and techniques.

8A.5 SPECIAL TRAINING COURSE

Title	Tank Farms Non-U.S. Department of Energy Contractor Orientation (proposed)
Description	Course consists of a classroom presentation using structured notes and/or a videocassette. Topics to be presented in compliance with state and federal requirements include the following: • Entry and exit requirements • Location of organizational charts • Administrative and operating procedures • Person in charge of communications • Potential hazards • Restricted areas • Potential emergencies, alarms, communications, responses, and staging areas • Location and use of emergency equipment • Identification of waste management units • Overview of the process • Training requirements.
Target audience	Non-U.S. Department of Energy contractor personnel
Delivery	Classroom or videocassette
Evaluation	Not applicable
Length	1 hour
Frequency	Not applicable

PERFORM LIQUID EFFLUENT RETENTION FACILITY RCRA INSPECTIONS

I. SYSTEM DESCRIPTION

This procedure provides instructions for inspecting the Liquid Effluent Retention Facility (LERF) Resource Conservation and Recovery Act (RCRA) Permitted Facility which is used for the interim storage of mixed radioactive dangerous waste as defined in the Washington Administrative Code (WAC) 173-303.

This procedure, also, provides instructions for performing an Annual Safety and Emergency Equipment Inventory for the LERF. This inventory includes all fire extinguishers, emergency lights/lanterns, portable eyewash, spill kit, telephones, portable radios.

Inspection of these facilities is required by RCRA and the Washington Administrative Code (WAC), Dangerous Waste Regulations. The requirements may be found in the 40 CFR (Code of Federal Regulations) 265.15, 40 CFR 265.223, 40 CFR 265.226, WAC 173-303-320, and WAC 173-303-650(4). Regular inspections of these facilities are necessary to identify and prevent malfunctions, deteriorations, operator errors, and discharges which may cause or lead to the release of dangerous waste constitutes to the environment and/or cause a threat to human health. These inspections must be conducted often enough to identify and correct problems before they harm human health or the environment.

The Inventory is, also, required by the Washington State Department of Ecology Dangerous Waste Regulations. WAC 173-303-350 requires that Contingency Plans contain a list of all emergency equipment at the facility. The list should contain items such as fire extinguishing systems, spill control equipment, communications and alarm systems, and decontamination equipment. The list must be kept up to date. In addition, the plan must include the location and a physical description of each item on the list, and a brief outline of its capabilities.

The LERF is located in the 200 East Area, approximately 0.75 mile north of the 242-A Evaporator and about 1 mile north of the PUREX plant (Figure 1-1 "Liquid Effluent Retention Facility Operations Facility"). The LERF consists of three 6.5 million-gallon surface impoundments (basins). The purpose of the LERF is to provide interim dangerous waste storage capacity for effluent from the 242-A Evaporator until a new treatment system is operational.

I. SYSTEM DESCRIPTION (Cont.)

The three basins are arranged side-by-side with 60 feet between each basin. Each basin is constructed with primary and secondary liners, consisting of a synthetic membrane and essentially impermeable soil composite. The upper or primary liner has 60-mil high-density polyethylene (HDPE) geomembrane directly of a manufactured geotextile/bentonite sandwich layer with a hydraulic conductivity of not more than 10^{-7} centimeter per second. The lower or secondary liner is a composite of a 60-mil HDPE geomembrane and a layer of essentially impermeable soil with a hydraulic conductivity of not more that 10^{-7} centimeters per second. Located between the primary and secondary liners, the leachate collection, detection, and removal system provides for detection and removal of any liquid entering that area. A floating geomembrane cover of 60-mil very low-density polyethylene is stretched over each basin above the primary liner. Activated carbon breather filters to provide ventilation of the basins are located in the covers.

The facility is with the 200 East Area limited access perimeter fence with another operational security fence. Access to the facility is limited to facility operators and other appropriate personnel on an as-needed basis.

To ensure safety, the LERF is inspected daily by operations personnel when the basins contain waste. If the basins do not contain waste, the LERF is inspected weekly to ensure compliance with applicable federal and state regulations. The LERF also is inspected for run-on, run-off, cover integrity, and erosion problems after significant precipitation events.

II. REFERENCE DOCUMENTS

WHC-IP-0263-TF: Tank Farm Building Emergency Plan

TO-040-080: Inspection of Fire Extinguishers and Hose Lines

III. PRESTART CONDITION

TFO supervision will ensure that the inspections accomplished in this procedure are performed by personnel who have received and are current in their Dangerous Waste Training.

IV. SAFETY

<u>Warning</u> - Use care to avoid or minimize injury. Possible safety hazards include the following:

Tripping
Slipping
Injuries to hands/head

IV. SAFETY (Cont.)

Radioactive or chemical exposure/contamination
Exposure to poisonous snakes/spiders

Wear approved safety equipment, including bump caps and gloves. Rubber gloves are required whenever there is a possibility of encountering moisture.

Warning - A health physics technician (HPT) will be required whenever self-monitoring limits are exceeded.

Ensure some form of communication is available, and functioning (i.e. radio and/or telephone), in case of an emergency. Check the communication device to be used at least once each day before accomplishing the inspections. Perform this check by contacting one of the following (Off-Shift contacts are provided in case the "RCRA" inspection are accomplished after day shift hours):

AREA	DEVICE	DIAL/CALL
East	Radio	Station 19
	Phone	3-2573/3-3913
OFF-SHIFT	RADIO	STATION 22
	PHONE	3-2689

If an emergency should occur or abnormal conditions exists, notify supervision immediately at one of the above listed Telephone or Radio Station Numbers.

Applicable Safety Documents - Provisions of Radiation Protection Manual, WHC-CM-4-10; Radiation Work Requirements and Permits Manual, WHC-CM-4-15, Vol. 2; Industrial Safety Manual, WHC-CM-4-3, Vols 1-3; Building Emergency Plan, WHC-IP-0263-TF; and Tank Farm Safety Rules apply to all work performed under this procedure.

V. TOOLS AND SUPPLIES

- SWPs Clothing (as required)
- Rubber Gloves
- Canvas Gloves (rubber gloves if moisture is present)
- Bump Hat
- Portable Radio (if other forms of communication are unavailable)
- Facility Key (Maintained in Tank Farm shift Office)
- WHC-IP-0263-TF: Tank Farm Building Emergency Plan
- TO-040-480: Inspection of Fire Extinguishers and Hose Lines

EMERGENCY EQUIPMENT:

- Spill Kit
- Fire Extinguisher
- Portable Eyewash

DATA SHEETS/CHECKLIST:

- LERF DAILY GENERAL RCRA INSPECTION CHECKLIST
- LERF DAILY RCRA LEACHATE AND LIQUID LEVEL INSPECTION CHECK
- LERF WEEKLY GENERAL RCRA INSPECTION CHECKLIST
- LERF WEEKLY GENERAL RCRA INSPECTION CHECKLIST
- LERF WEEKLY INTEGRITY RCRA INSPECTION CHECKLIST
- LERF MONTHLY RCRA SAFETY, EMERGENCY, COMMUNICATION EQUIPMENT INSPECTION CHECKLIST
- LERF RCRA DEFICIENCY CONTINUATION SHEET
- LERF ANNUAL RCRA SAFETY, EMERGENCY, AND COMMUNICATION EQUIPMENT INVENTORY DATA SHEET

VI. TABLE OF CONTENTS

VII. PROCEDURE

A. PERFORM DAILY RCRA INSPECTIONS FOR THE LERF

Management Information - Washington Administrative Code (WAC), Chapter 173-303, Dangerous Waste Regulations, Part 320, General Inspections, require regularly scheduled inspections by the owners and/or operators of facilities which treat, store, and/or dispose of dangerous and/or mixed wastes (as defined in WAC 173-303). These inspections are to look for conditions that may be harmful to human health and/or to the environment. Additionally, WAC 173-303, Part 320, requires the following:

- The owner/operator shall keep an "Inspection Log" or summary at the facility for at least 3 years from the date of the inspection.

NOTE - The attached "RCRA" Checklists are provided and designed to comply with the regulatory requirement. They are to be completed and kept in the *FACILITY RCRA INSPECTION RECORDS BOOK* kept in the Area's Day Shift Office for the required three years.

- At a minimum, the "Inspection Log" (or in this case, the *LERF RCRA Inspection Records Book*) must note the date of the inspection; the time of the inspection; the printed name of the inspector; the signature of the inspector; notations of the observations made; and the date and nature of any repair or remedial actions taken as a result of the inspection.

- Deficiencies must be corrected on a schedule consistent with the severity of the problem (e.g. immediately if there is a risk to human health and/or to the environment). Correction must be noted on the "Inspection Log" (or in this case, the *LERF RCRA Inspection Records Book*).

NOTE - Deficiencies are to be recorded in the COMMENTS block of the "RCRA" Checklists; corrections are to be recorded in the REMEDIAL ACTION block. The "RCRA" Checklists are not to be considered CLOSED OUT until all the deficiencies recorded in the COMMENTS block are answered by notation in the REMEDIAL ACTION block. The JCS work package number is to be recorded in the REMEDIAL ACTION block of the "RCRA" Checklist if the deficiency cannot be corrected directly. Recording of the JCS number in the REMEDIAL ACTION block will be sufficient to regard the "RCRA" Checklist as being CLOSED OUT.

A. PERFORM DAILY RCRA INSPECTIONS FOR THE LERF (Cont.)

1. **PRIOR** to inspection, **EXAMINE** the most recent "RCRA" Inspection Checklist and **NOTE** any deficiencies as well as the corrective action taken. **WHILE** in the field, **NOTE** the progress of the corrective action taken.

2. **INSPECT**, daily, the following (Immediately report all leaks to supervision):

   - Are all gates entrances to the facility, not in use, locked?
   - Leaks to the environment
   - Damage to the liners or piping
   - Floating covers in place and intact
   - Floating covers free from wind-blown debris
   - Leachate pump switches in proper position
   - Leachate pumps green lights working

   a. **USE** the *Lerf Daily RCRA Leachate and Liquid Level Inspection Checklist*. **RECORD** the date and time in the date and time blocks on each page of the "RCRA" Checklist.

   b. **INSPECT** the facility against each item on the "RCRA" Checklist.

NOTE - Any "RCRA" Inspection Checklist item marked in the <u>NO</u> column requires a comment in the COMMENTS block. If additional space is required attach a *RCRA Deficiency Continuation Sheet*.

3. **INSPECT**, LERF leachate system and liquid level of each basin.

   a. **USE** the *Lerf Daily RCRA Leachate and Liquid Level Inspection Checklist*. Complete one Checklist per active basin (basin containing liquid). **RECORD** the date and time in the date and time blocks on each page of the "RCRA" Checklist.

   b. **RECORD** the following on the "RCRA" Checklist:

      1. The Current flow for the leachate pump (FQI 42-1, FQI 43-1, FQI 44-1).

      2. The previous day's flow for the leachate pump.

      3. The subtraction of the previous day's leachate flow from the current days leachate flow.

      4. The present liquid level.

      NOTE - Liquid level in the basin must be less than 21 feet.

      5. The previous day's liquid level.

A. PERFORM DAILY RCRA INSPECTIONS FOR THE LERF (Cont.)

WARNING

TFO supervision is to be notified in an emergency or an abnormal condition. The numbers are listed below:

AREA	DEVICE	DIAL/CALL
EAST	RADIO	STATION 19
	PHONE	3-2573/3-3913
* OFF-SHIFT	RADIO	STATION 22
	PHONE	3-2689

* Off-Shift contacts are provided in case the "RCRA" inspection are accomplished after day shift hours.

4. **AFTER** completing the inspections, **PRINT** your name legibly in the (INSPECTED BY) block provided.

5. **SIGN, DATE,** and **RECORD** the time that the inspection was completed.

6. **RETURN** all completed "RCRA" Checklists to supervision for review, sign off and distribution.

NOTE - Copies of the "RCRA" Checklist are to be sent to the following:

- Tank Farm Operations Shift Office
- Tank Farm Support Operations
- Evaporator Restart
- Tank Farm Surveillance Analysis Support

- The LERF "RCRA" CHECKLISTS are to be retained in the *LERF RCRA INSPECTION RECORDS BOOK*, located in the Area's Day Shift Office, for a minimum of three years from the date of the inspection.

- Supervision will ensure the "RCRA" Checklist is CLOSED OUT. A CLOSED OUT "RCRA" Checklist will note the remedial action taken for each deficiency noted in the COMMENTS block.

B. PERFORM WEEKLY RCRA INSPECTIONS FOR THE LERF

NOTE - Weekly inspections should be conducted on the same day of each week. In the event of a holiday, perform weekly inspections on the next workday. In the event of a storm (wind or precipitation) weekly inspections should be performed after the storm.

1. **INSPECT**, weekly, the following:

- Fences
- Postings
- Dust/debris buildup
- Unusual conditions or Maintenance
- Lighting

a. **USE** the *Lerf Weekly General RCRA Inspection Checklist*. **RECORD** the date and time in the date and time blocks on each page of the "RCRA" Checklist.

b. **INSPECT** the facility against each item on the "RCRA" Checklist.

NOTE - Any "RCRA" Inspection Checklist item marked in the NO column requires a comment in the COMMENTS block. If additional space is required attach a *RCRA deficiency continuation sheet*.

B. PERFORM WEEKLY RCRA INSPECTIONS FOR THE LERF (Cont.)

2. **INSPECT**, weekly for the following (Immediately report all leaks to supervision):

- Animal burrows in or around the facility
- Abnormal wet spots/spills
- Corrosion on structures
- Vegetation growth around/in the basins or facility
- Rips or tears in the covers
- Liner edge cap tearing/failing
- Damage to any structures
- erosion or deteriorations to the dikes
- Standing water on the covers
- Leachate pumps working
- Transfer pumps working

a. **USE** the *Lerf Weekly Integrity RCRA Inspection Checklist*. **RECORD** the date and time in the date and time blocks on each page of the "RCRA" Checklist.

b. **INSPECT** the facility against each item on the "RCRA" Checklist.

NOTE - Any "RCRA" Inspection Checklist item marked in the NO column requires a comment in the COMMENTS block. If additional space is required attach a *RCRA deficiency continuation sheet*.

WARNING

TFO supervision is to be notified in an emergency or an abnormal condition. The numbers are listed below:

AREA	DEVICE	DIAL/CALL
EAST	RADIO	STATION 19
	PHONE	3-2573/3-3913
* OFF-SHIFT	RADIO	STATION 22
	PHONE	3-2689

* Off-Shift contacts are provided in case the "RCRA" inspection are accomplished after day shift hours.

3. **AFTER** completing the inspections, **PRINT** your name legibly in the (INSPECTED BY) block provided.

4. **SIGN**, **DATE**, and **RECORD** the time that the inspection was completed.

5. **RETURN** all completed "RCRA" Checklists to supervision for review, sign off and distribution.

NOTE - Copies of the "RCRA" Checklist are to be sent to the following:

- Tank Farm Operations Shift Office
- Tank Farm Support Operations
- Evaporator Restart
- Tank Farm Surveillance Analysis Support

- The LERF "RCRA" CHECKLISTS are to be retained in the *LERF RCRA INSPECTION RECORDS BOOK*, located in the Area's Day Shift Office, for a minimum of three years from the date of the inspection.

- Supervision will ensure the "RCRA" Checklist is CLOSED OUT. A CLOSED OUT "RCRA" Checklist will note the remedial action taken for each deficiency noted in the COMMENTS block.

C. **PERFORM MONTHLY RCRA INSPECTIONS OF THE SAFETY, EMERGENCY, AND COMMUNICATION EQUIPMENT FOR THE LERF**

1. **PRIOR** to inspection, **OBTAIN** a copy of the *Annual RCRA Safety, Emergency, and Communication Equipment Inventory Data Sheet.*

NOTE - The *Annual RCRA Safety, Emergency, and Communication Equipment Inventory Data Sheet* can be obtained from the "Specific" *LERF RCRA Inspection Records Book* located in the LERF operations building.

- Referencing the "RCRA" Data Sheet is necessary. The "RCRA" Data Sheets identifies the locations of the equipment. The purpose of this inspection is to verify that the equipment is in place, readily available, and in working order.

2. **OBTAIN** the *Lerf Monthly RCRA Safety, Emergency, Communication Equipment Inspection Checklist.* **RECORD** the date and time in the date and time blocks on each page of the "RCRA" Checklist.

NOTE - Any "RCRA" Inspection Checklist item marked in the NO column requires a comment in the COMMENTS block. If additional space is required attach a *RCRA deficiency continuation sheet*.

a. **INSPECT,** Monthly the following safety, emergency and communication equipment.

1. Telephones:

   • **VERIFY** the phones are in place and functioning.

2. Radios:

   • **VERIFY** the radios are functioning.

C. PERFORM MONTHLY RCRA INSPECTIONS OF THE SAFETY, EMERGENCY, AND COMMUNICATION EQUIPMENT FOR THE LERF (Cont.)

3. Portable Eye Wash:

WARNING

When preparing to drain portable eyewash bottles, bleed off air in the bottles before draining eyewash solution.

Follow manufacturer's specifications for draining and refilling the eye wash bottles.

NOTE - The portable eyewash bottles must be drained and refilled once every month to prevent build-up of any infectious organisms in the eyewash solution.

a. **VERIFY** the portable eye wash is in its proper location.

b. **BLEED** off the air in the bottle. **OPEN** eyewash bottle and drain eyewash solution from the portable eyewash bottle.

c. Visually **INSPECT** the interior of the eyewash bottle. **ENSURE** the bottle is clean and free of any infectious agents.

d. **FLUSH** the eyewash bottle with plenty of water.

e. **REFILL** the eyewash bottle to the prescribed height as recommended by the manufacturer.

f. **CLOSE** eyewash bottle and **CHARGE** with air to the manufacturer specified pressure.

g. **FILL OUT** tag on container documenting the day the task was completed.

h. **INSPECT** the pressure gage and exterior of the eyewash bottle for any damage.

i. **MARK** the appropriate column in the "RCR" Inspection Checklist.

j. If unusual conditions are found, **RECORD** in the comment block of the "RCRA" inspection sheet.

C. **PERFORM MONTHLY RCRA INSPECTIONS OF THE SAFETY, EMERGENCY, AND COMMUNICATION EQUIPMENT FOR THE LERF (Cont.)**

4. Spill Kit:

   INSPECT the Spill Kit for use. **EXAMINE** the kit against each item listed on the *Annual RCRA Safety, Emergency, and Communication Equipment Inventory Data Sheet*. **CHECK** for shelf life items (these should also be listed on the "RCRA" Inventory Data Sheet). **REPLACE** shelf life items as necessary.

5. Fire Extiguishers:

   a. **INSPECT** Fire Extinguisher and Hose Line Inspection per TO-040-480.

   b. **RECORD** information on inspection sheet 54-6200-080, refer to figure XX.

   c. **MARK** the appropriate column in the "RCR" Inspection Checklist .

   d. If unusual conditions are found, **RECORD** in the comment block of the "RCRA" inspection sheet.

   e. **ATTACH** inspection sheet 54-6200-080 to *Lerf Monthly RCRA Safety, Emergency, Communication Equipment Inspection Checklist*.

6. Emergency Lanterns

   a. Visually note that the Emergency Lanterns are in there correct location.

   b. Check that maintenance has accomplished their monthly inspection of the emergency Lanterns (check the PM data sheets in Room 8, 272-AW for East Area).

C. PERFORM MONTHLY RCRA INSPECTIONS OF THE SAFETY, EMERGENCY, AND COMMUNICATION EQUIPMENT FOR THE LERF (Cont.)

WARNING

TFO supervision is to be notified in an emergency or an abnormal condition. The numbers are listed below:

AREA	DEVICE	DIAL/CALL
EAST	RADIO	STATION 19
	PHONE	3-2573/3-3913
* OFF-SHIFT	RADIO	STATION 22
	PHONE	3-2689

* Off-Shift contacts are provided in case the "RCRA" inspection are accomplished after day shift hours.

7. **AFTER** completing the inspections, **PRINT** your name legibly in the (INSPECTED BY) block provided.

8. **SIGN, DATE,** and **RECORD** the time that the inspection was completed.

9. **RETURN** all completed "RCRA" Checklists to supervision for review, sign off and distribution.

NOTE - Copies of the "RCRA" Checklist are to be sent to the following:

- Tank Farm Operations Shift Office
- Tank Farm Support Operations
- Evaporator Restart
- Tank Farm Surveillance Analysis Support

- The LERF "RCRA" CHECKLISTS are to be retained in the *LERF RCRA INSPECTION RECORDS BOOK*, located in the Area's Day Shift Office, for a minimum of three years from the date of the inspection.

- Supervision will ensure the "RCRA" Checklist is CLOSED OUT. A CLOSED OUT "RCRA" Checklist will note the remedial action taken for each deficiency noted in the COMMENTS block.

D. PERFORM ANNUAL RCRA SAFETY, EMERGENCY, AND COMMUNICATION EQUIPMENT INVENTORY

1. **USE** the *Annual RCRA Safety, Emergency, and Communication Equipment Inventory Data Sheet*. **RECORD** the date and time in the date and time blocks on each page of the "RCRA" Checklist.

2. **CHECK** each facility for each item on the "RCRA" Data Sheet. **VERIFY** existing items and any new or missing items.

3. **RECORD** anything unusual or in the COMMENTS block.

4. **AFTER** completing the inventory, **PRINT** your name legibly in the (INSPECTED BY) block provided.

5. **SIGN**, **DATE**, and **RECORD** the time that the inventory was completed.

6. **RETURN** all completed "RCRA" Checklists to supervision for review, sign off and distribution.

NOTE - Copies of the "RCRA" Checklist are to be sent to the following:

- Tank Farm Operations Shift Office
- Tank Farm Support Operations
- Evaporator Restart
- Tank Farm Surveillance Analysis Support

7. **ROUTE** completed and reviewed "RCRA" Data Sheets to Tank Farm Environmental Engineering for update of the Tank Farm Emergency Plan (WHC-IP-0263-TF).

NOTE - The LERF "RCRA" CHECKLISTS are to be retained in the *LERF RCRA INSPECTION RECORDS BOOK*, located in the Area's Day Shift Office, for a minimum of three years from the date of the inspection.

- Supervision will ensure the "RCRA" Checklist is CLOSED OUT. A CLOSED OUT "RCRA" Checklist will note the remedial action taken for each deficiency noted in the COMMENTS block.

- The most current "RCRA" Data Sheet will be used in performing the various RCRA inspections discussed in this procedure.

LERF DAILY GENERAL RCRA INSPECTION CHECKLIST
PAGE 1 of 2

(GATES, LEAKS, DAMAGE, ETC.)

INSPECTED BY		DATE	
	(Signature)	TIME	
	(Printed Name)		

Note: Any item marked in the NO column requires a comment in the COMMENTS block.

RESPONSE		YES	NO	N/A
1.	Are the gates or entrances, not in use, locked?			
2.	Evidence of any leaks to the environment from any of the basins or piping not apparent?			
3.	Are the basins liners or piping free from damage?			
4.	Are the floating covers in place and free from damage?			
5.	Are the floating covers free from wind-blown debris?			
6.	Are all the leachate pumps switches in there proper position (auto for basin that have liquid, on determined by supervision, off for basins with no liquid in the basin)?			
7.	Are the lechate pump(s) green light(s) on (look at only lights related to active basins)?			
8.	Have all the used SWP clothing and used masks requiring picked up or restocking been picked up or restocked?			
9.	Has the trash been emptied?			
10.	Are any unusual radiological conditions not posted? Check with HPT.			

LERF DAILY GENERAL RCRA INSPECTION CHECKLIST PAGE 2 of 2			
(GATES, LEAKS, DAMAGE, ETC.)			
		DATE	
		TIME	
COMMENTS Undertake immediate action where possible.			
REMEDIAL ACTION		DATE	
REVIEWED BY		DATE	
	(Signature)		
	(Printed Name)		

LERF DAILY RCRA LEACHATE AND LIQUID LEVEL INSPECTION CHECK
PAGE 1 of 2

(Leachate, Basin Liquid Level)

BASIN NUMBER		DATE	
INSPECTED BY		TIME	
	(Signature)		
	(Printed Name)		

RESPONSE	LEACHATE FLOW/ LIQUID LEVEL	
1. Record the current flow for the leachate pump (FQI 42-1, FQI 43-1, or FQI 44-1).	PUMP NUMBER	
	FLOW	
2. Record the previous day's flow for the leachate pump (from previous day's Inspection Checklist).	FLOW	
3. Subtract flow in step 2 from the flow in step 1. (step 1 - step 2). This value must be less than XX. If not notify supervision and comment in the comment section.		
4. Record the present liquid level (This liquid level must be less than 21 feet).		
5. Record the previous day's liquid level (from previous day's Inspection Checklist).		

LERF DAILY RCRA LEACHATE AND LIQUID LEVEL INSPECTION CHECK PAGE 2 of 2			
(Leachate, Basin Liquid Level)			
BASIN NUMBER		DATE	
		TIME	
COMMENTS Undertake immediate action where possible.			
REMEDIAL ACTION		DATE	
REVIEWED BY		DATE	
	(Signature)		
	(Printed Name)		

LERF WEEKLY GENERAL RCRA INSPECTION CHECKLIST
PAGE 1 of 3

(Housekeeping)

INSPECTED BY		DATE	
	(Signature)	TIME	
	(Printed Name)		

Note: Any item marked in the NO column requires a comment in the COMMENTS block.

RESPONSE		YES	NO	N/A
1.	Are the fences in good condition (look for broken or bent wires within the fence, abnormal holes or gaps under the fence, broken or bent hinges and latches on the gates, loose or broken fence connectors on poles, inoperable locks, etc)?			
2.	Note whether the appropriate signs posted are posted. Are they in good condition? Look for rust, bent, fading, etc.			
a.	Are the "Hazardous Material/Danger Unauthorized Personnel Keep Out" signs posted at each entrance and at 100 foot intervals along the fence?			
b.	Are the Radiation Monitoring and Operator Coverage required before entry posted at each entrance (phone numbers to call are displayed)?			
c.	Is the Shift Manager's phone number with instructions to call prior to enter or exit at each entrance?			
d.	Is the Persons names and Phone numbers to contact in the event of an emergency at each entrance?			
e.	Are the radiation signs posted at each entrance and at 100 foot intervals along the fence?			
f.	Are the No Smoking signs posted at each entrance and at 100 foot intervals along the fence?			

LERF WEEKLY GENERAL RCRA INSPECTION CHECKLIST PAGE 2 of 3			
(Housekeeping)			
INSPECTED BY	(Signature)	DATE	
		TIME	
	(Printed Name)		

Note: Any item marked in the NO column requires a comment in the COMMENTS block.

RESPONSE	YES	NO	N/A
3. Is the Dust/debris buildup (e.g. paper, rags, tumbleweeds, trash, etc) in or around the facility picked up?			
4. Are all unusual conditions or maintenance needs taken care of?			
5. Are the all the lights working in and around the facility?			

LERF WEEKLY GENERAL RCRA INSPECTION CHECKLIST
PAGE 3 of 3

(Housekeeping)

		DATE	
		TIME	
COMMENTS Undertake immediate action where possible.			
REMEDIAL ACTION		DATE	
REVIEWED BY		DATE	
	(Signature)		
	(Printed Name)		

LERF WEEKLY INTEGRITY RCRA INSPECTION CHECKLIST
PAGE 1 of 2

(LERF Integrity)

INSPECTED BY		DATE	
	(Signature)	TIME	
	(Printed Name)		

Note: Any item marked in the NO column requires a comment in the COMMENTS block.

RESPONSE	YES	NO	N/A
1. Is the facility free from animal burrows?			
2. Is the facility free from abnormal wet spots/spills?			
3. Are all structures free from corrosion?			
4. Are the basins and the facility free from all vegetation growth?			
5. Is the fence free from accumulating windblown debris?			
6. Are the covers free from rips and tears?			
7. Is the liner edge cap in good condition? Free from any tears/failing?			
8. Are all structures (Change Trailer, Step-off-Pad, Storage building, etc.) free from any evidence of damage?			
9. Are all the dikes free from erosion or other signs of deteriorations (Look carefully after it has rained)?			
10. Are all covers free from standing water (Look carefully after it has rained)?			
11. Have the leachate pumps been checked for operability by maintenance?			
12. Have the transfer pumps been checked for operability by maintenance?			

LERF WEEKLY INTEGRITY RCRA INSPECTION CHECKLIST PAGE 2 of 2			
(LERF Integrity)			
		DATE	
		TIME	
COMMENTS **Undertake immediate action where possible.**			
REMEDIAL ACTION		DATE	
REVIEWED BY		DATE	
	(Signature)		
	(Printed Name)		

LERF MONTHLY RCRA SAFETY, EMERGENCY, COMMUNICATION EQUIPMENT INSPECTION CHECKLIST
PAGE 1 OF 3

EYE WASH STATION, SPILL KIT, COMMUNICATION EQUIPMENT, FIRE EXTINGUISURES, AND EMERGENCY LANTERNS

		DATE	
INSPECTED BY		TIME	
	(Signature)		
	(Printed Name)		

Note: Any item marked in the NO column requires a comment in the COMMENTS block.

RESPONSE		YES	NO	N/A
1. Test the phones by calling: East Area - 3-573/3-3913 (or for Off-Shift - 3-2689). Are they functioning properly? Note the problem and location in the COMMENTS block.				
2. Test the radios by calling: East Area - Station 19 (or for Off-Shift - Station 22). Are they functioning properly? Note the problem and location in the COMMENTS block.				
3. Functionally test the eyewash (follow procedure). Sign and date the tag. Is it functioning ok? If not, note the problem and location in the COMMENTS block.				
4. Inspect the Spill Kit	Are all the items that are supposed to be in the spill kit there? Match to items on the *Annual RCRA Safety, Emergency, and Communication Equipment Inventory Data Sheet*.			
	Check the *Annual RCRA Safety, Emergency, and Communication Equipment Inventory Data Sheet*. If there are spill kit items with a specified shelf life, are they within their specified shelf life time period?			

LERF MONTHLY RCRA SAFETY, EMERGENCY, COMMUNICATION EQUIPMENT INSPECTION CHECKLIST PAGE 2 OF 3
EYE WASH STATION, SPILL KIT, COMMUNICATION EQUIPMENT, FIRE EXTINGUISURES, AND EMERGENCY LANTERNS

		DATE	
INSPECTED BY		TIME	
	(Signature)		
	(Printed Name)		

Note: Any item marked in the NO column requires a comment in the COMMENTS block.

RESPONSE	YES	NO	N/A
4. Inspect each Fire Extinguishers. Are they in the correct location? Fill out the Fire Extinguisher and Hose Line Inspection Form and attach to this checklist.			
5. Visually note that the Emergency Lanterns are in there correct location. Has maintenance accomplished their monthly inspection of these Lanterns (check the PM data sheets in room 8, 272-AW for East Area and room 8, 272-WA for West Area)?			

LERF MONTHLY RCRA SAFETY, EMERGENCY, COMMUNICATION EQUIPMENT INSPECTION CHECKLIST
PAGE 3 of 3

EYE WASH STATION, SPILL KIT, COMMUNICATION EQUIPMENT, FIRE EXTINGUISURES, AND EMERGENCY LANTERNS

		DATE	
		TIME	
COMMENTS Undertake immediate action where possible.			
REMEDIAL ACTION		DATE	
REVIEWED BY		DATE	
	(Signature)		
	(Printed Name)		

LERF RCRA DEFICIENCY CONTINUATION SHEET

		DATE	
INSPECTED BY		TIME	
	(Signature)		
	(Printed Name)		
COMMENTS Undertake immediate action where possible.			
REMEDIAL ACTION		DATE	
REVIEWED BY		DATE	
	(Signature)		
	(Printed Name)		

LERF ANNUAL RCRA SAFETY, EMERGENCY, AND COMMUNICATION EQUIPMENT INVENTORY DATA SHEET
PAGE 1 OF 3

FIRE EXTINGUISHERS, EMERGENCY LIGHTS, EYEWASHES, SPILL KITS, TELEPHONES, RADIOS, AND INTERCOMS

INVENTORIED BY		DATE	
	(Signature)		
		TIME	
	(Printed Name)		

EQUIPMENT	YES/ NO	LOCATION	TYPE	CAPACITY
1. FIRE EXTINGUISHER				
2. EMERGENCY LIGHT				
4. EYEWASH				

LERF ANNUAL RCRA SAFETY, EMERGENCY, AND COMMUNICATION EQUIPMENT INVENTORY DATA SHEET
PAGE 2 OF 3

FIRE EXTINGUISHERS, EMERGENCY LIGHTS, SAFETY SHOWERS, EYEWASHES, SPILL KITS, TELEPHONES, RADIOS, AND INTERCOMS

	DATE		TIME	

EQUIPMENT	YES /NO	LOCATION	SUPPLIES	QUANTITY (Units: gal, lbs, ect.)	SHELF LIFE (Renewal Date(s))
5. SPILL KIT					
6. TELEPHONE					

LERF ANNUAL RCRA SAFETY, EMERGENCY, AND COMMUNICATION EQUIPMENT INVENTORY
DATA SHEET
PAGE 3 OF 3

FIRE EXTINGUISHERS, EMERGENCY LIGHTS, SAFETY SHOWERS, EYEWASHES, SPILL KITS, TELEPHONES, RADIOS, AND INTERCOMS

		DATE	
		TIME	
COMMENTS Undertake immediate action where possible.			
REMEDIAL ACTION		DATE	
REVIEWED BY		DATE	
	(Signature)		
	(Printed Name)		

CORRESPONDENCE DISTRIBUTION COVERSHEET

Author	Addressee	Correspondence No.
J. D. Williams, 376-7542	T. L. Nord, Ecology	Incoming: 9101781 Ref #9152605

Subject: TRANSMITTAL OF MANAGEMENT PLANS FOR THE LIQUID EFFLUENT RETENTION FACILITY PRIOR TO THE PART B PERMIT SUBMITTAL

INTERNAL DISTRIBUTION

Approval	Date	Name	Location	w/att
		Correspondence Control	A3-01	
		R. J. Bliss	B3-04	
		L. C. Brown	H4-51	
		G. P. Burchell	R3-30	
		G. D. Carpenter	B2-16	
		J. A. Eacker	R1-51	
		B. G. Erlandson	B2-19	
		C. J. Geier	H4-57	
		R. J. Julian	R1-48	
		D. E. Kelley	R1-48	
		R. E. Lerch (assignee)	B2-35	
		D. E. McKenney	R1-48	
		L. L. Powers	B2-35	
		S. M. Price	H4-57	
		D. A. Turner	R1-48	
		J. L. Waite	B2-35	
		J. D. Williams	H4-57	
		B. D. Williamson	B3-51	
		EDMC	H4-22	
		JDW File/LB	H4-57	

Attachments same as letter #9152605

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